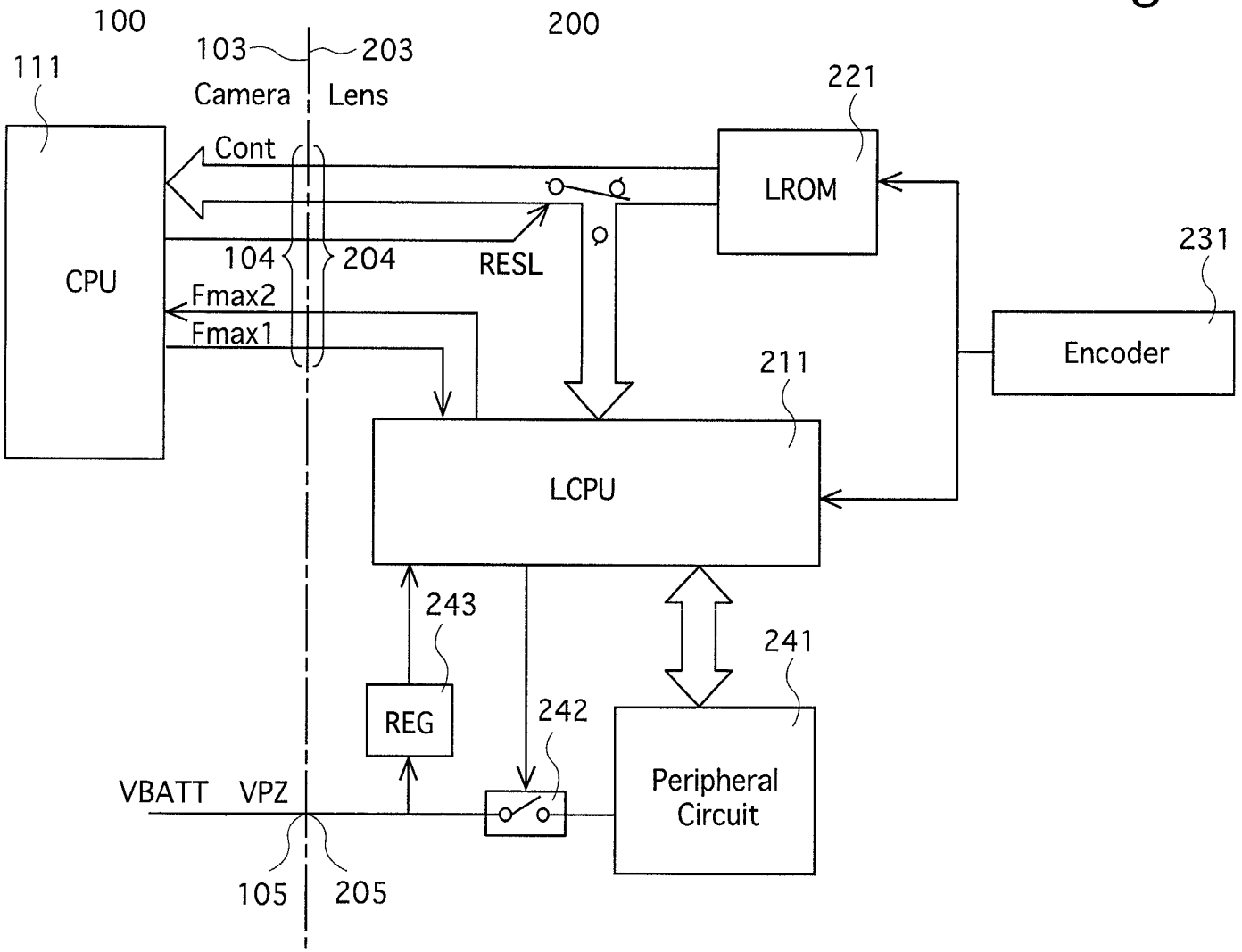
Fig.1


100
200
103
203
111
Camera
Lens
221
Cont
LROM
231
CPU
104
204
RESL
Fmax2
Fmax1
Encoder
211
LCPU
243
241
REG
242
VBATT
VPZ
Peripheral
Circuit
105
205

20220-8T9E80T

Fig.2

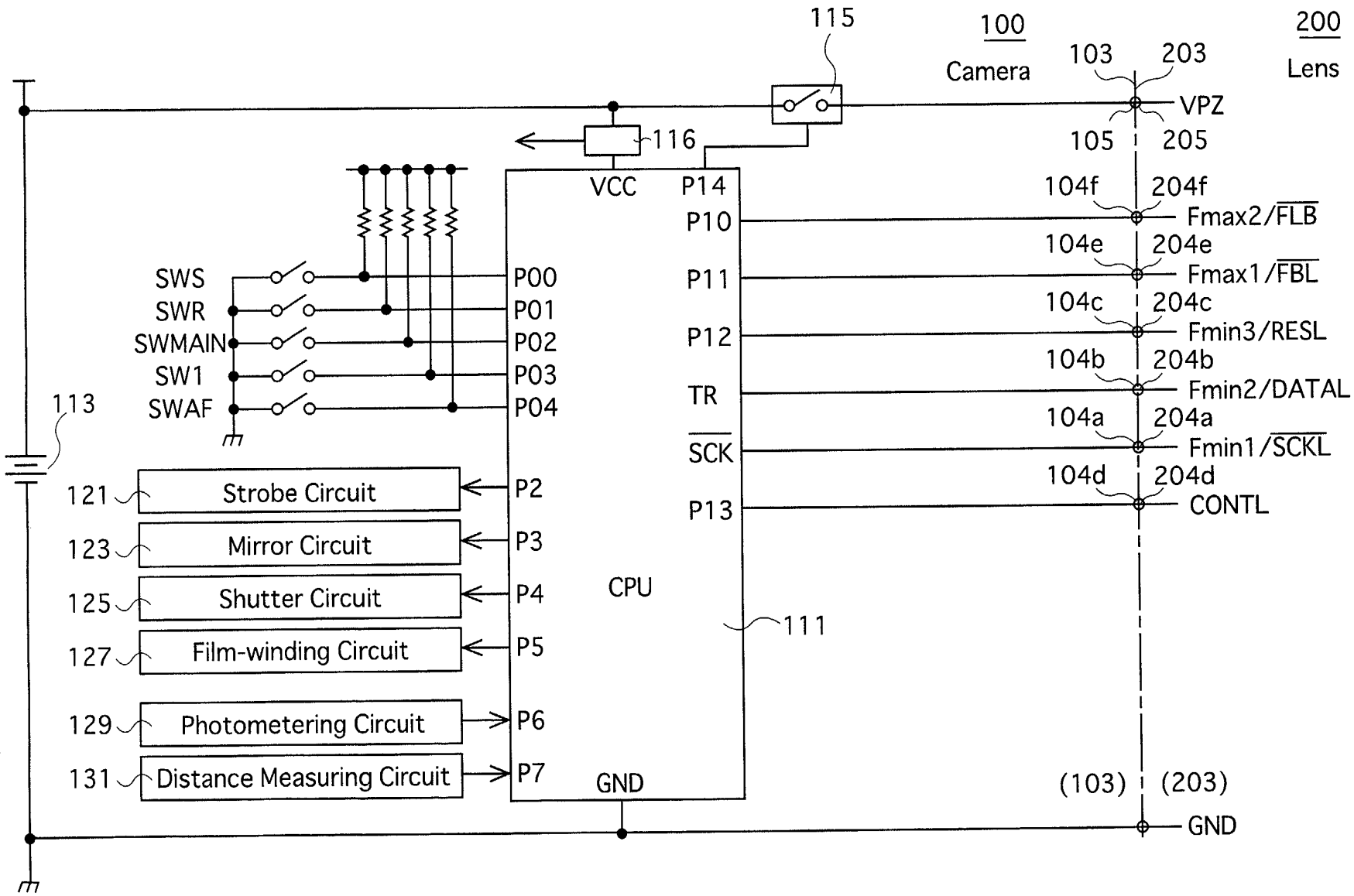


Fig.3

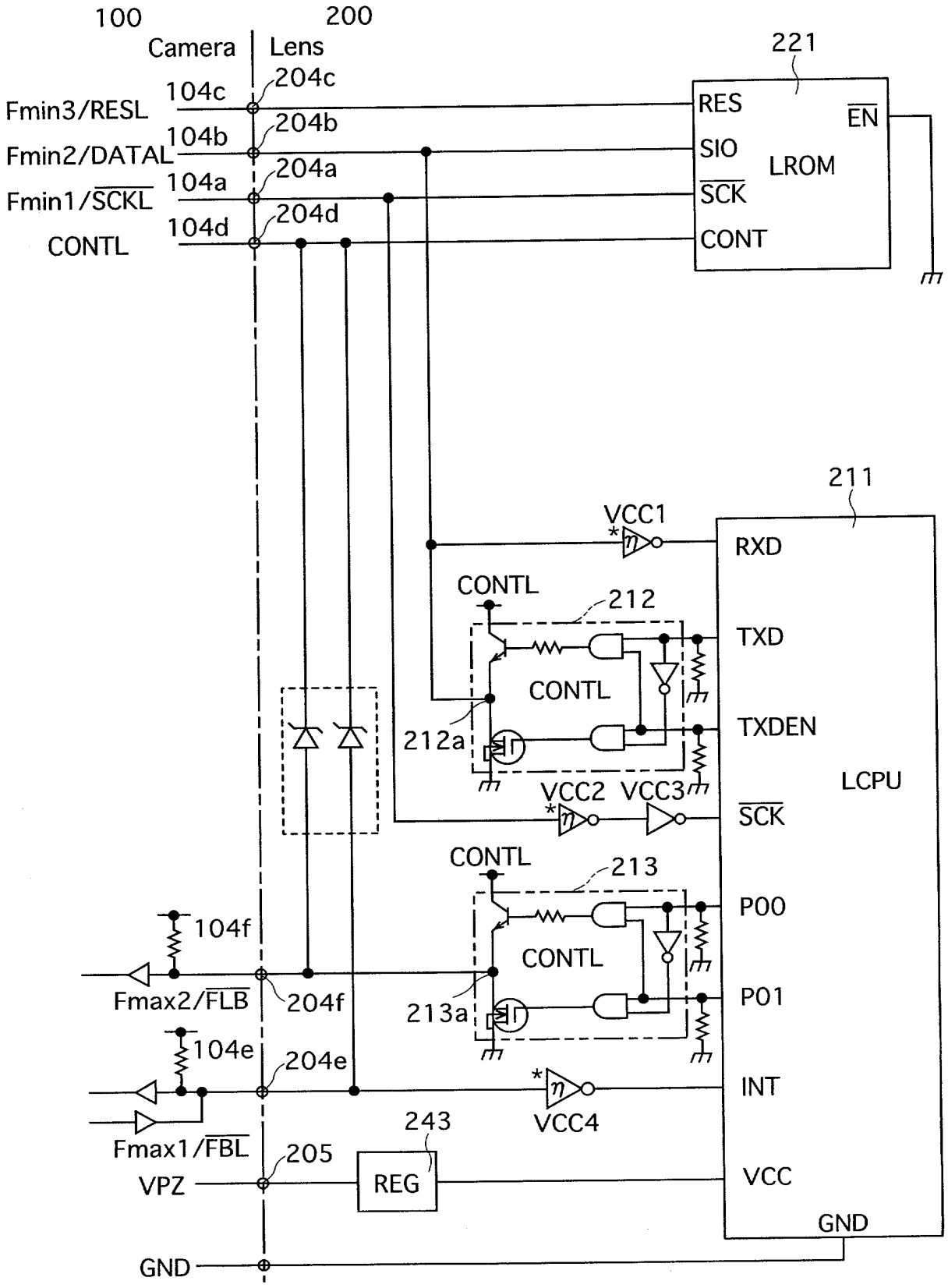

100
Camera
200
Lens
221
104c
204c
Fmin3/RESL
RES
EN
104b
204b
Fmin2/DATAL
SIO
LROM
104a
204a
Fmin1/SCKL
SCK
104d
204d
CONTL
CONT
211
VCC1
RXD
CONTL
212
TXD
CONTL
212a
TXDEN
LCPU
VCC2
VCC3
SCK
CONTL
213
P00
104f
CONTL
Fmax2/FLB
204f
213a
P01
104e
204e
INT
VCC4
243
Fmax1/FBL
205
VPZ
REG
VCC
GND
GND

Fig.4

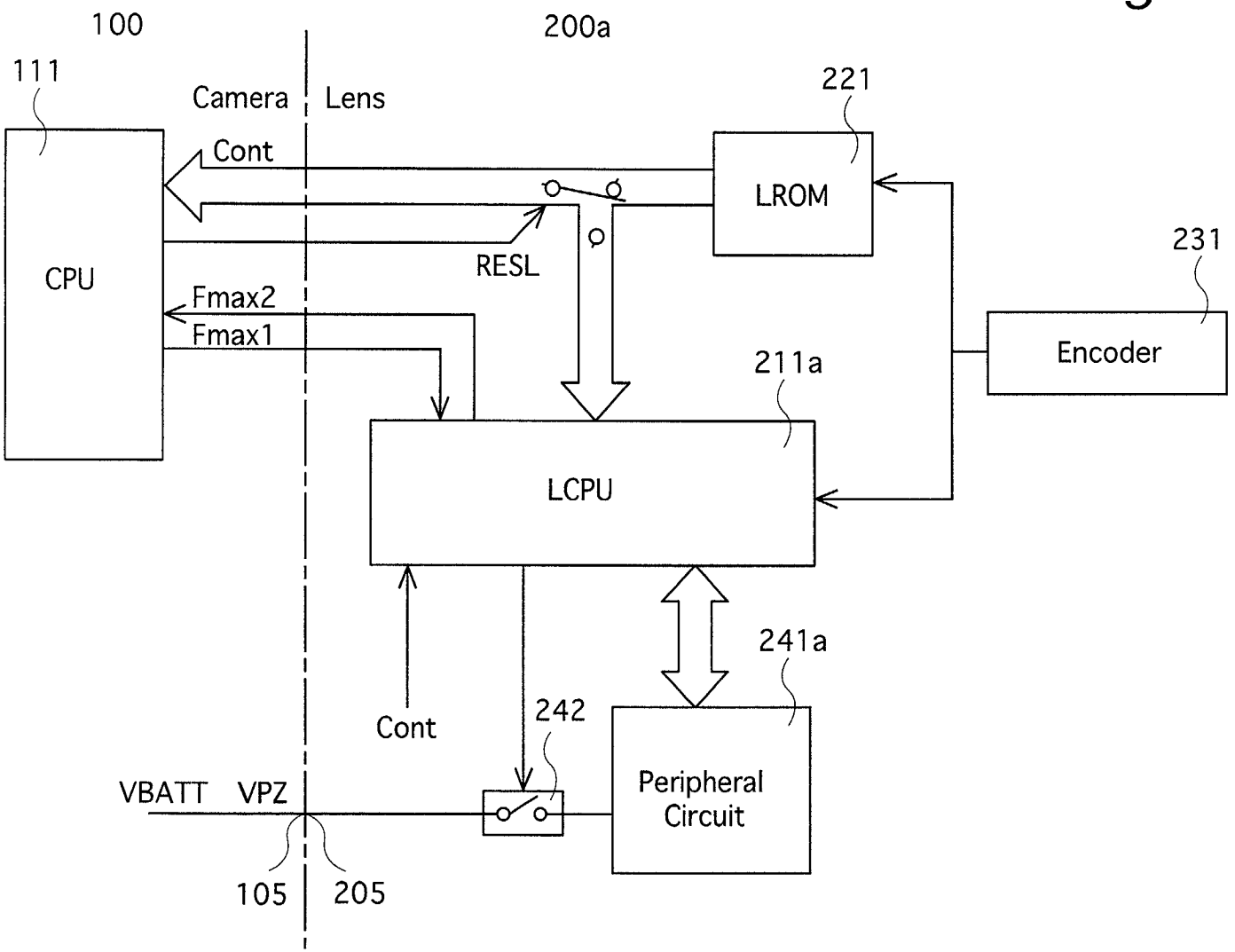

100
200a
111
Camera
Lens
221
Cont
LROM
231
CPU
RESL
Fmax2
Fmax1
Encoder
211a
LCPU
241a
Cont
242
VBATT
VPZ
Peripheral
Circuit
105
205

Fig.5

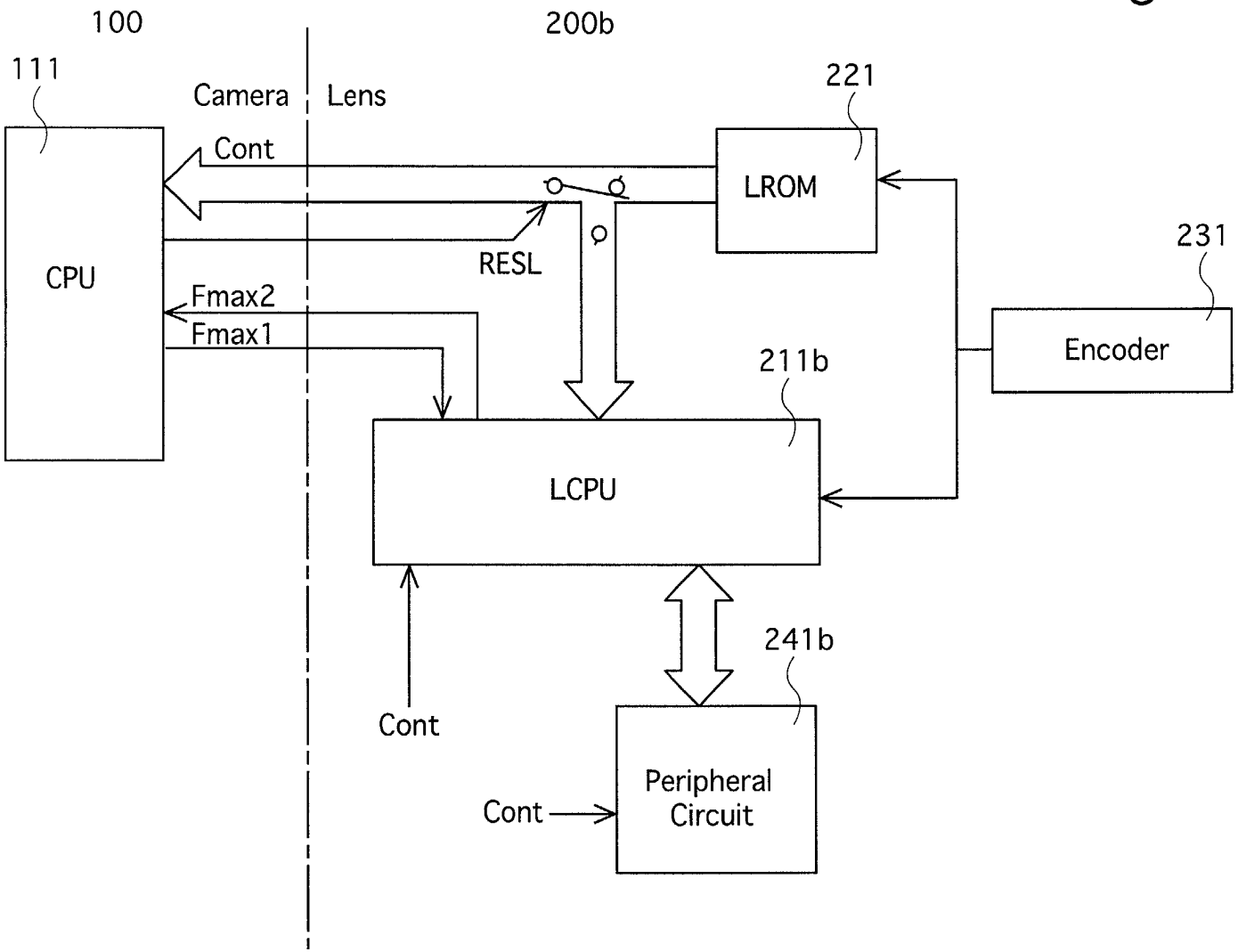

100
200b
111
Camera
Lens
221
Cont
LROM
231
CPU
RESL
Fmax2
Fmax1
Encoder
211b
LCPU
241b
Cont
Peripheral Circuit
Cont

Fig. 6A

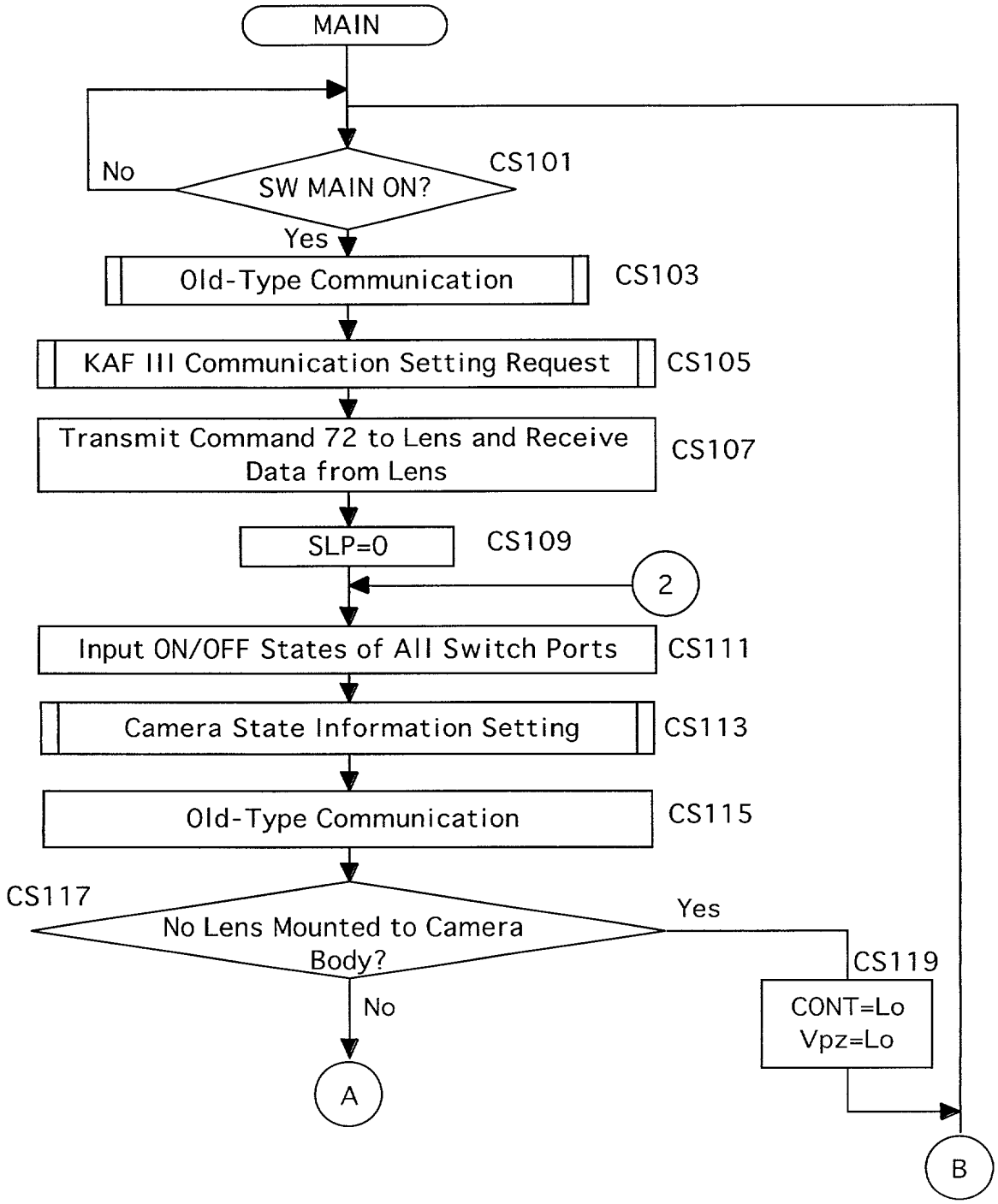

MAIN
No
SW MAIN ON?
CS101
Yes
Old-Type Communication
CS103
KAF III Communication Setting Request
CS105
Transmit Command 72 to Lens and Receive Data from Lens
CS107
SLP=0
CS109
2
Input ON/OFF States of All Switch Ports
CS111
Camera State Information Setting
CS113
Old-Type Communication
CS115
CS117
No Lens Mounted to Camera Body?
Yes
CS119
CONT=Lo
Vpz=Lo
No
A
B

Fig. 6B

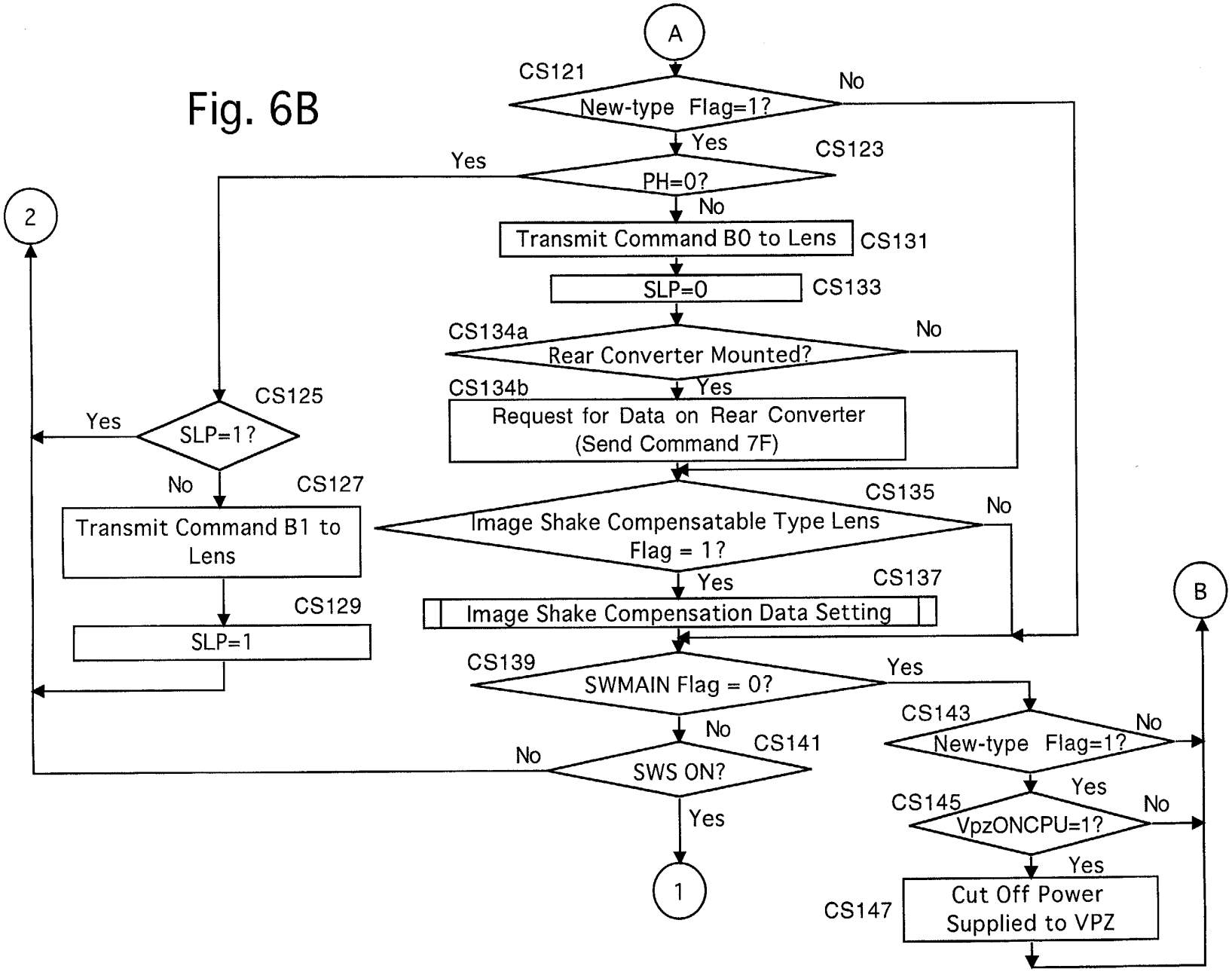

A
CS121
New-type Flag=1?
No
Yes
CS123
PH=0?
Yes
No
Transmit Command B0 to Lens
CS131
SLP=0
CS133
CS134a
Rear Converter Mounted?
No
CS134b
Yes
Request for Data on Rear Converter (Send Command 7F)
2
CS125
Yes
SLP=1?
No
CS127
Transmit Command B1 to Lens
CS129
SLP=1
CS135
Image Shake Compensatable Type Lens Flag = 1?
No
Yes
CS137
Image Shake Compensation Data Setting
B
CS139
SWMAIN Flag = 0?
Yes
No
CS141
SWS ON?
No
Yes
1
CS143
New-type Flag=1?
No
Yes
CS145
VpzONCPU=1?
No
Yes
CS147
Cut Off Power Supplied to VPZ

Fig. 7

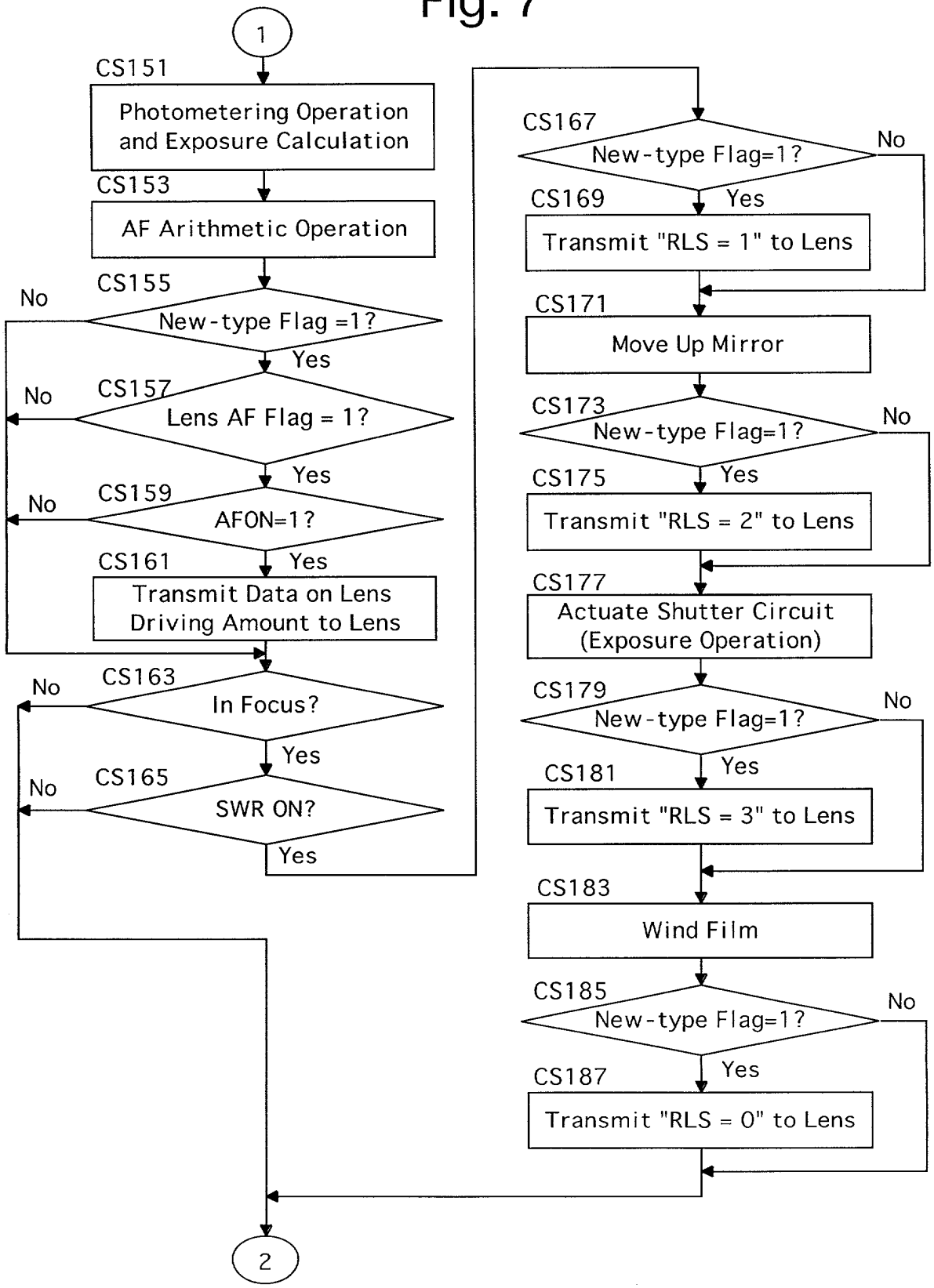

1
CS151
Photometering Operation and Exposure Calculation
CS153
AF Arithmetic Operation
CS155
New-type Flag =1?
No
Yes
CS157
Lens AF Flag = 1?
No
Yes
CS159
AFON=1?
No
Yes
CS161
Transmit Data on Lens Driving Amount to Lens
CS163
In Focus?
No
Yes
CS165
SWR ON?
No
Yes
CS167
New-type Flag=1?
No
Yes
CS169
Transmit "RLS = 1" to Lens
CS171
Move Up Mirror
CS173
New-type Flag=1?
No
Yes
CS175
Transmit "RLS = 2" to Lens
CS177
Actuate Shutter Circuit (Exposure Operation)
CS179
New-type Flag=1?
No
Yes
CS181
Transmit "RLS = 3" to Lens
CS183
Wind Film
CS185
New-type Flag=1?
No
Yes
CS187
Transmit "RLS = 0" to Lens
2

Fig. 8A

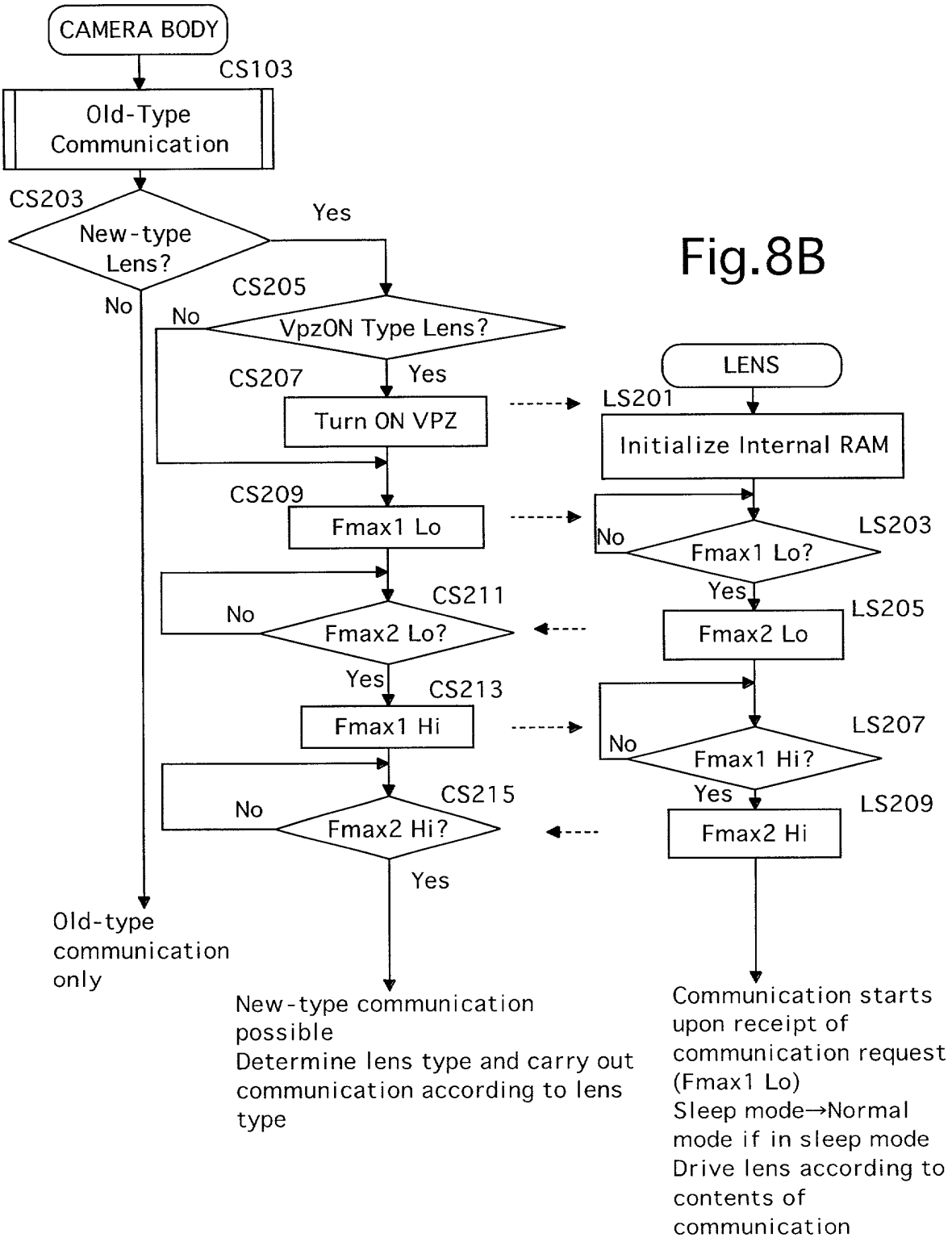

CAMERA BODY
CS103
Old-Type Communication
CS203
New-type Lens?
Yes
No
CS205
No
VpzON Type Lens?
CS207
Yes
Turn ON VPZ
CS209
Fmax1 Lo
CS211
No
Fmax2 Lo?
Yes
CS213
Fmax1 Hi
CS215
No
Fmax2 Hi?
Yes
Old-type communication only
New-type communication possible
Determine lens type and carry out communication according to lens type
LENS
LS201
Initialize Internal RAM
LS203
No
Fmax1 Lo?
Yes
LS205
Fmax2 Lo
LS207
No
Fmax1 Hi?
Yes
LS209
Fmax2 Hi
Communication starts upon receipt of communication request (Fmax1 Lo)
Sleep mode→Normal mode if in sleep mode
Drive lens according to contents of communication

Fig.8B

Fig.9

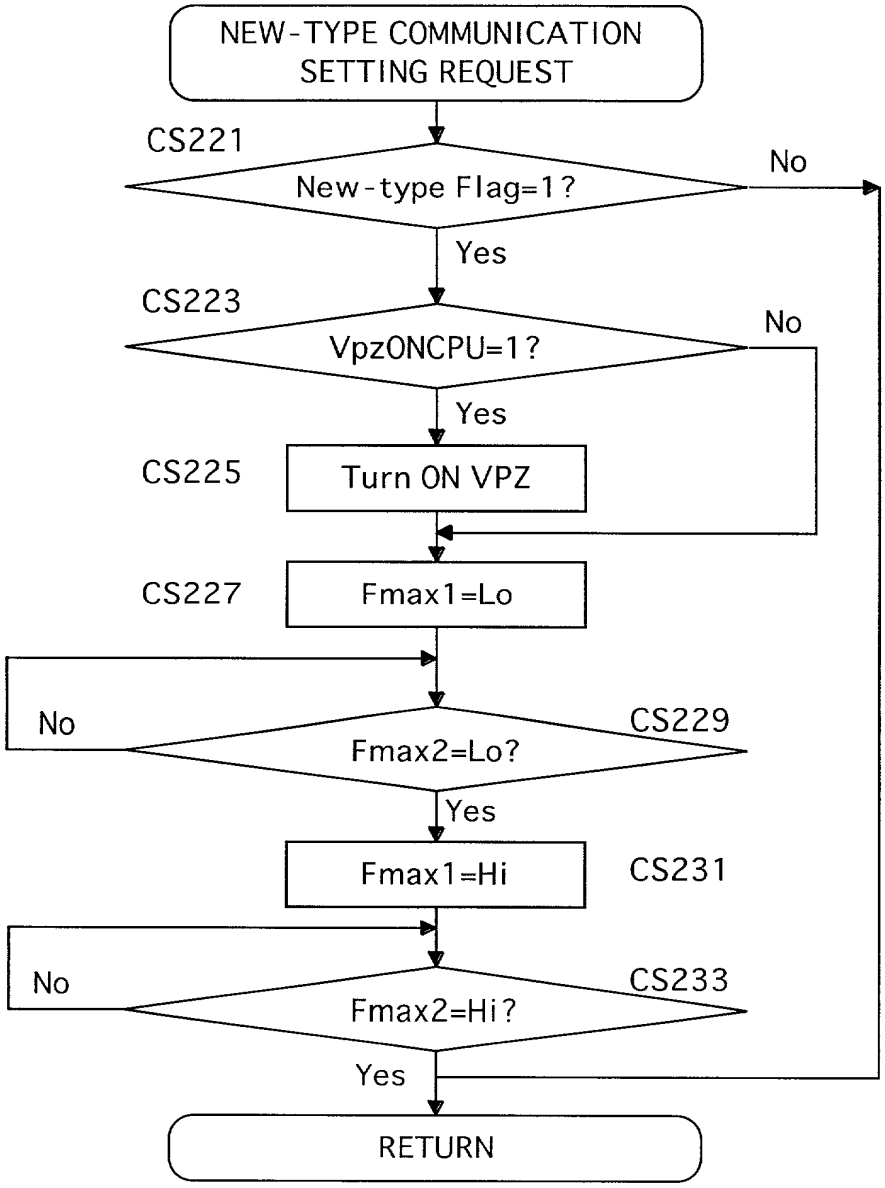

NEW-TYPE COMMUNICATION SETTING REQUEST
CS221
New-type Flag=1?
No
Yes
CS223
VpzONCPU=1?
No
Yes
CS225
Turn ON VPZ
CS227
Fmax1=Lo
No
CS229
Fmax2=Lo?
Yes
Fmax1=Hi
CS231
No
CS233
Fmax2=Hi?
Yes
RETURN

Fig.10

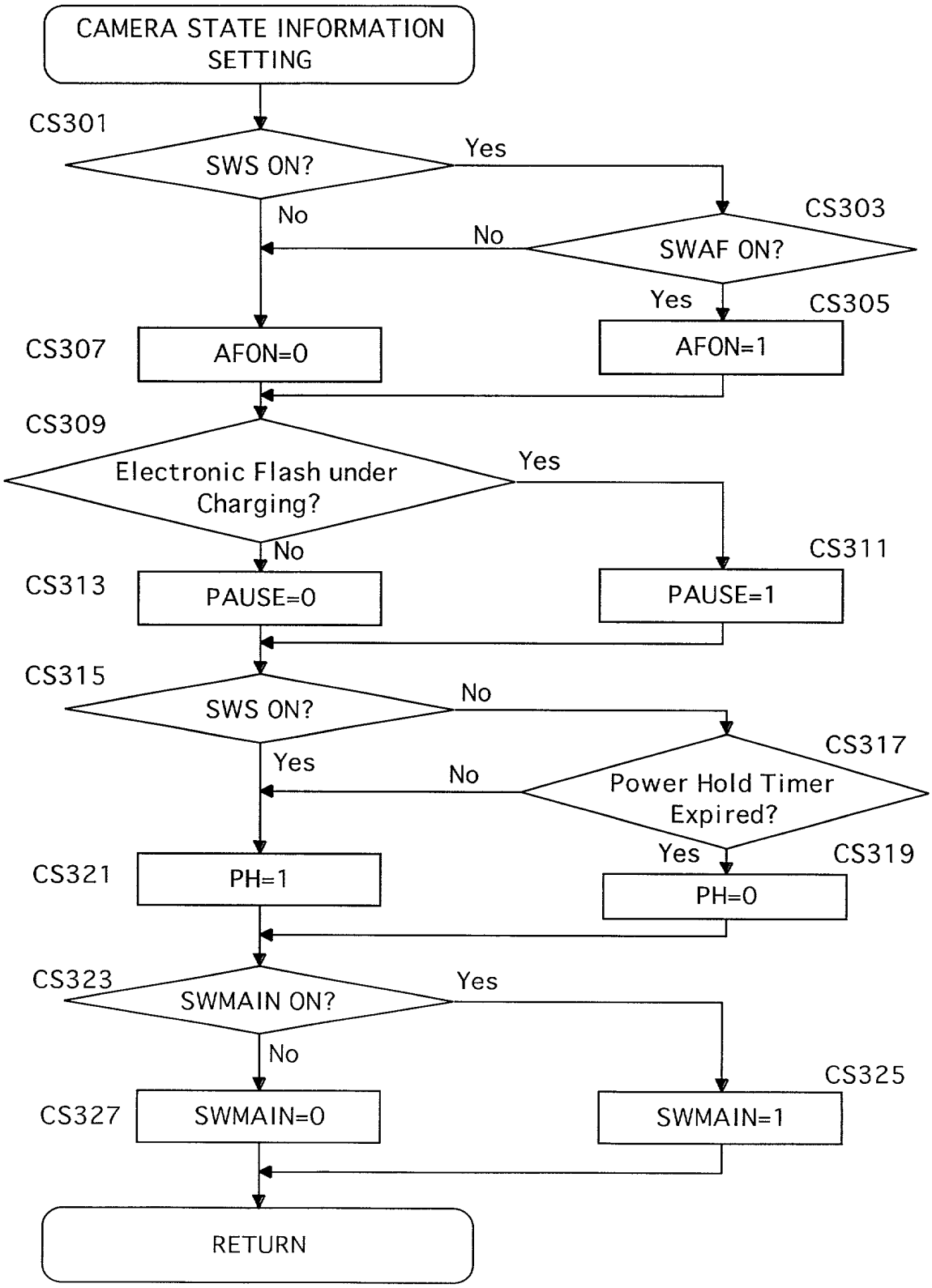

CAMERA STATE INFORMATION SETTING
CS301
SWS ON?
Yes
No
CS303
SWAF ON?
No
Yes
CS305
AFON=1
CS307
AFON=0
CS309
Electronic Flash under Charging?
Yes
No
CS311
PAUSE=1
CS313
PAUSE=0
CS315
SWS ON?
No
Yes
CS317
Power Hold Timer Expired?
No
Yes
CS319
PH=0
CS321
PH=1
CS323
SWMAIN ON?
Yes
No
CS325
SWMAIN=1
CS327
SWMAIN=0
RETURN

Fig.11

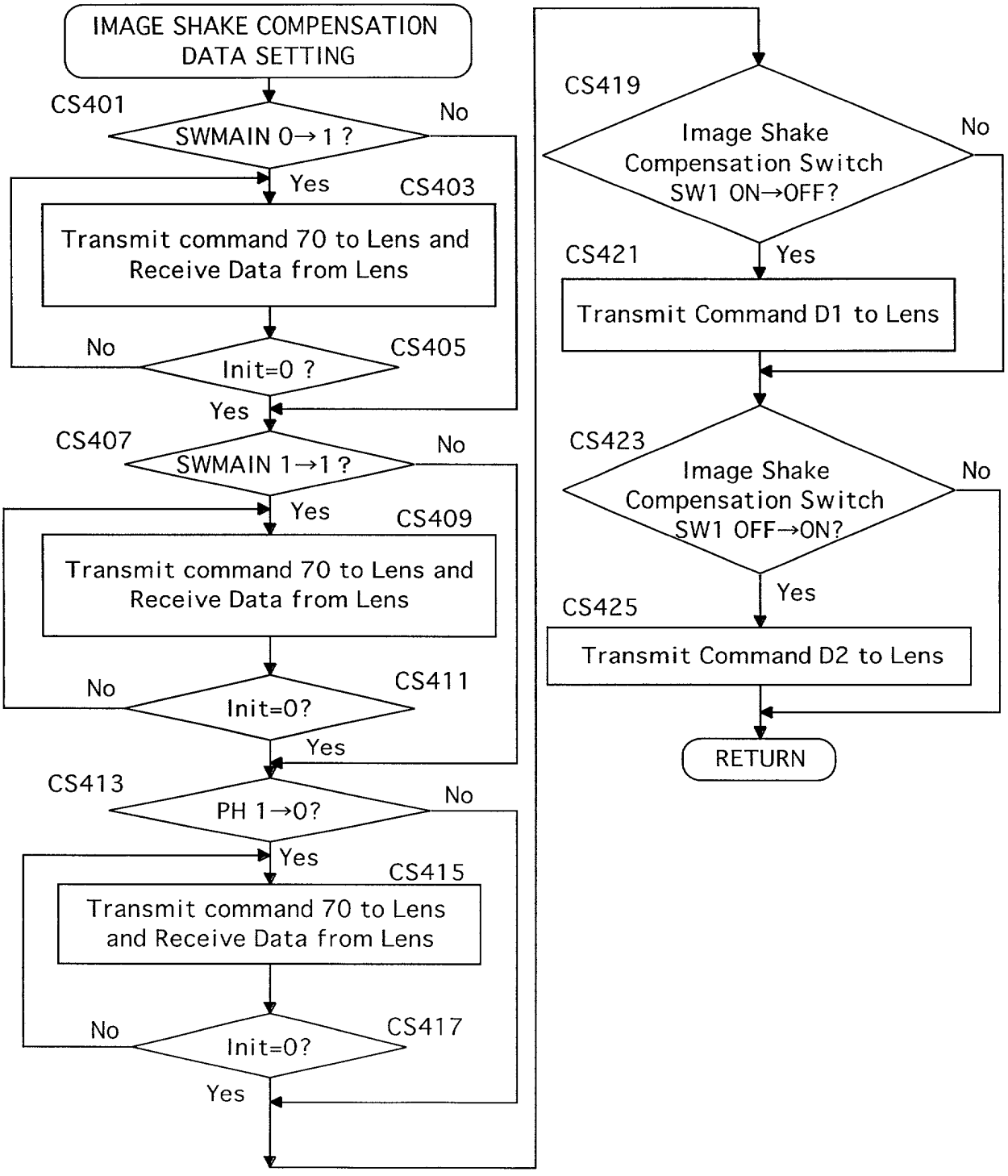


IMAGE SHAKE COMPENSATION DATA SETTING
CS401
SWMAIN 0→1 ?
No
Yes
CS403
Transmit command 70 to Lens and Receive Data from Lens
No
Init=0 ?
CS405
Yes
CS407
SWMAIN 1→1 ?
No
Yes
CS409
Transmit command 70 to Lens and Receive Data from Lens
No
Init=0?
CS411
Yes
CS413
PH 1→0?
No
Yes
CS415
Transmit command 70 to Lens and Receive Data from Lens
No
Init=0?
CS417
Yes
CS419
Image Shake Compensation Switch SW1 ON→OFF?
No
CS421
Yes
Transmit Command D1 to Lens
CS423
Image Shake Compensation Switch SW1 OFF→ON?
No
Yes
CS425
Transmit Command D2 to Lens
RETURN

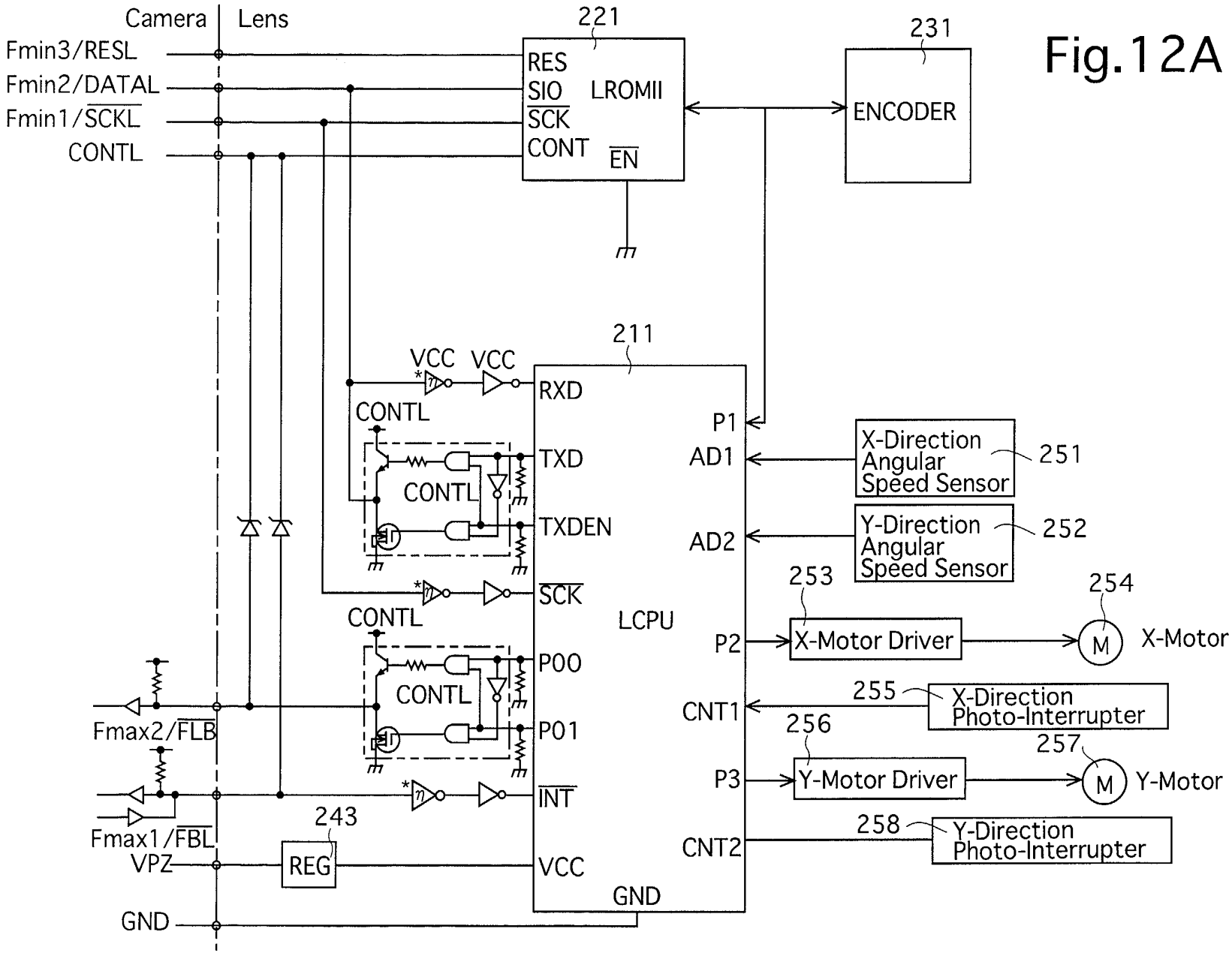
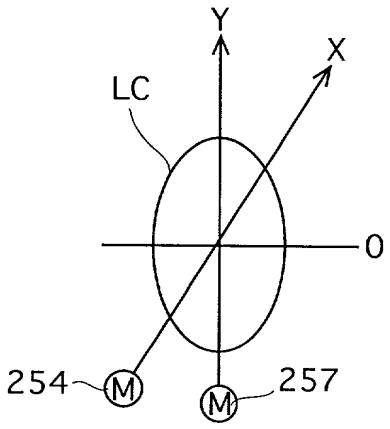

Camera
Lens
Fmin3/RESL
Fmin2/DATAL
Fmin1/SCKL
CONTL
221
RES
SIO
SCK
CONT
LROMII
EN
231
ENCODER
211
VCC
VCC
RXD
CONTL
TXD
CONTL
TXDEN
SCK
CONTL
P00
CONTL
P01
INT
LCPU
P1
AD1
AD2
P2
CNT1
P3
CNT2
X-Direction Angular Speed Sensor
251
Y-Direction Angular Speed Sensor
252
253
X-Motor Driver
254
M
X-Motor
255
X-Direction Photo-Interrupter
256
Y-Motor Driver
257
M
Y-Motor
258
Y-Direction Photo-Interrupter
Fmax2/FLB
Fmax1/FBL
VPZ
243
REG
VCC
GND
GND

Fig.12A

Fig. 12B



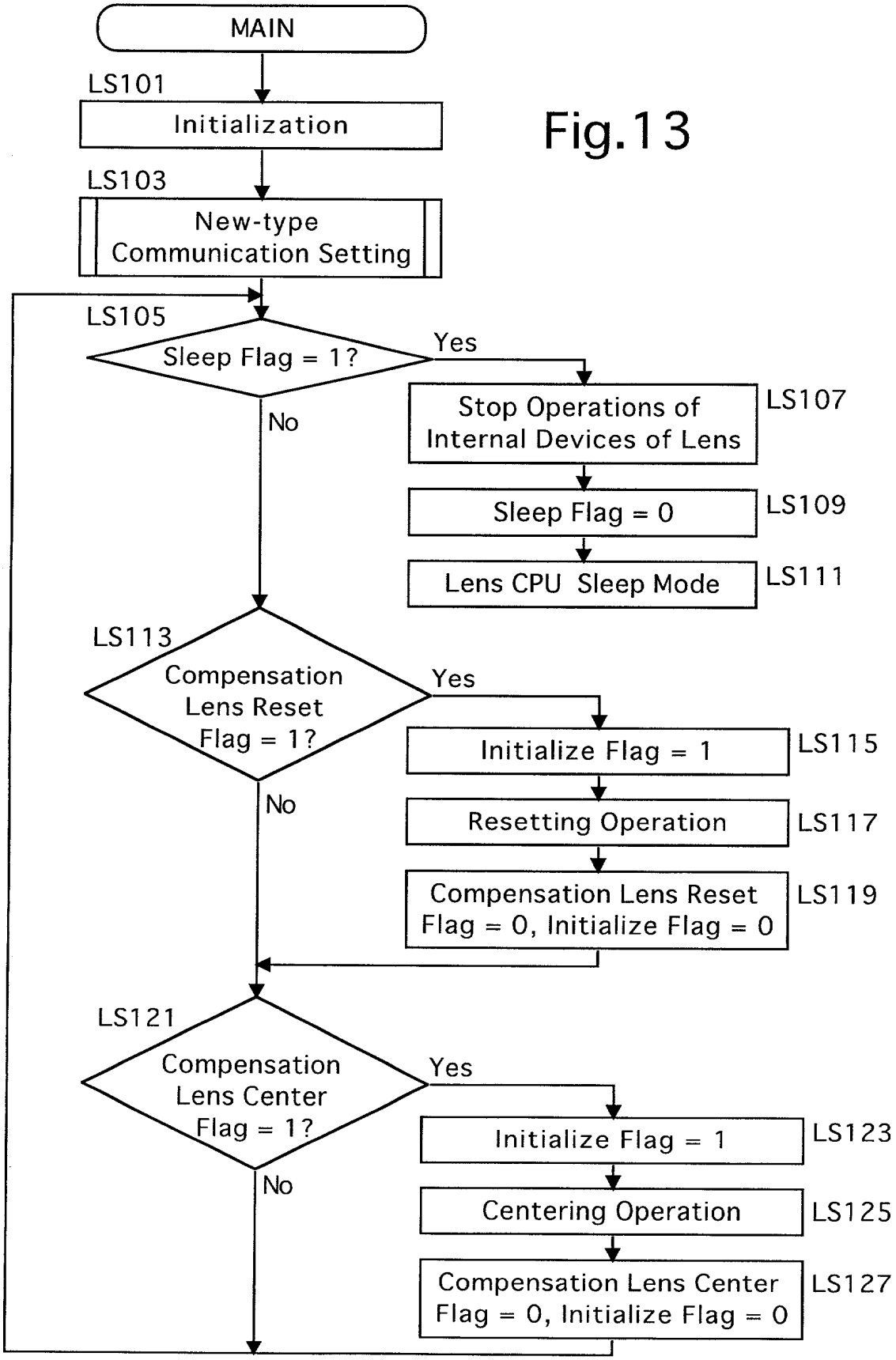
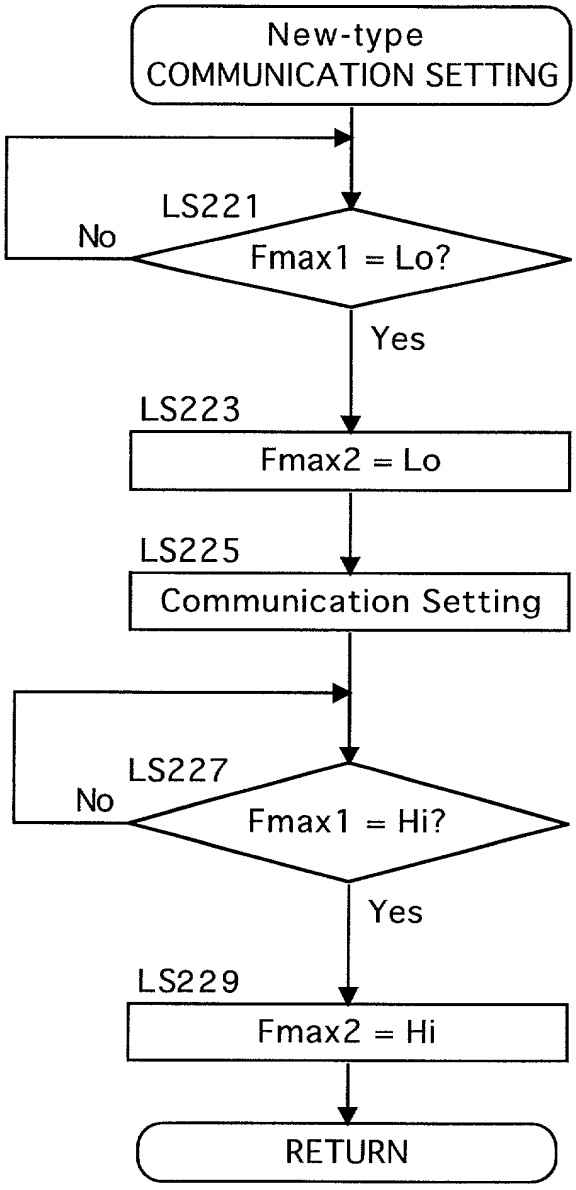

MAIN
LS101
Initialization
LS103
New-type Communication Setting
LS105
Sleep Flag = 1?
Yes
No
Stop Operations of Internal Devices of Lens
LS107
Sleep Flag = 0
LS109
Lens CPU Sleep Mode
LS111
LS113
Compensation Lens Reset Flag = 1?
Yes
No
Initialize Flag = 1
LS115
Resetting Operation
LS117
Compensation Lens Reset Flag = 0, Initialize Flag = 0
LS119
LS121
Compensation Lens Center Flag = 1?
Yes
No
Initialize Flag = 1
LS123
Centering Operation
LS125
Compensation Lens Center Flag = 0, Initialize Flag = 0
LS127

Fig.13

Fig.14


New-type
COMMUNICATION SETTING
LS221
No
Fmax1 = Lo?
Yes
LS223
Fmax2 = Lo
LS225
Communication Setting
LS227
No
Fmax1 = Hi?
Yes
LS229
Fmax2 = Hi
RETURN

ADVANCE SEARCH

Fig.15

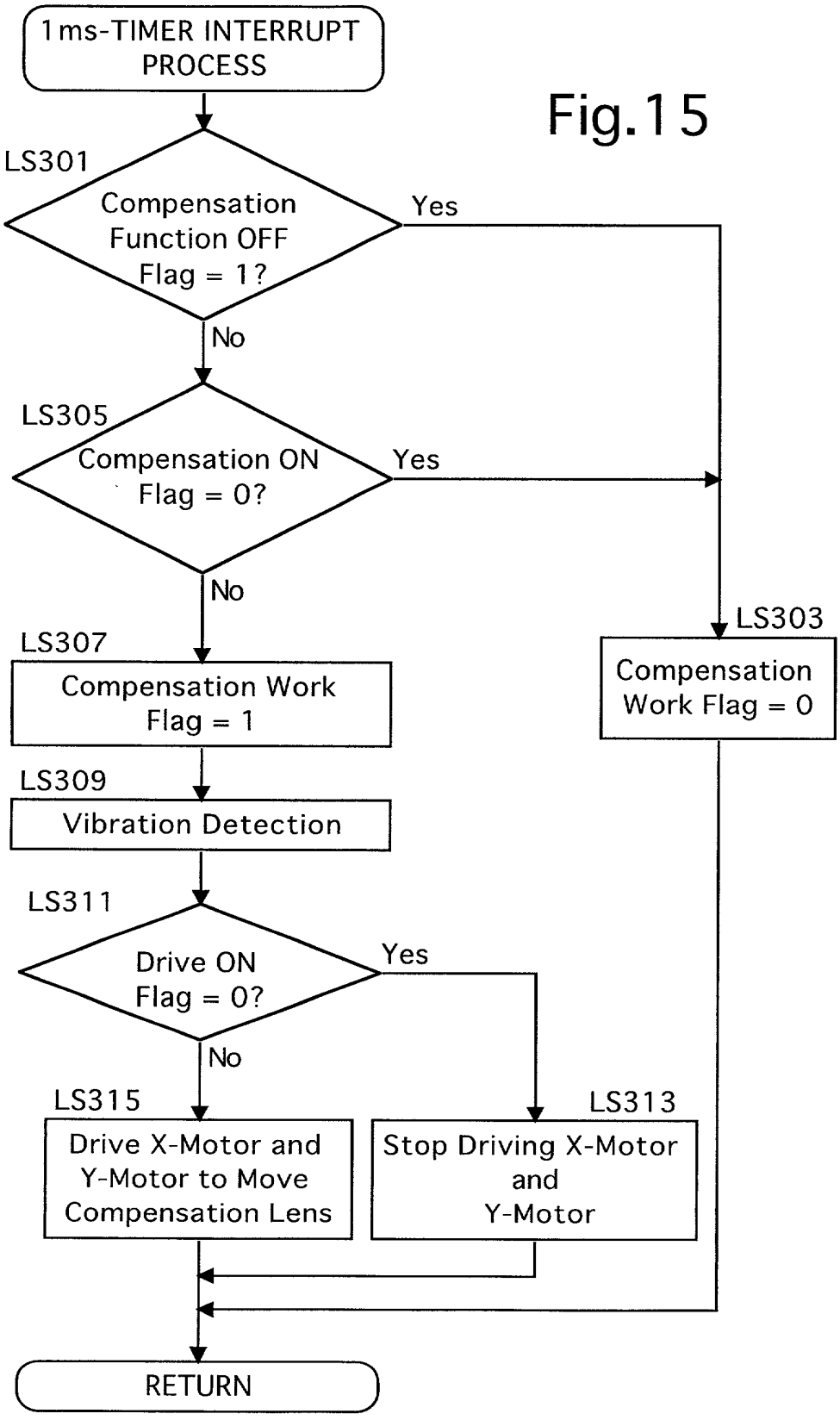


Fig.16

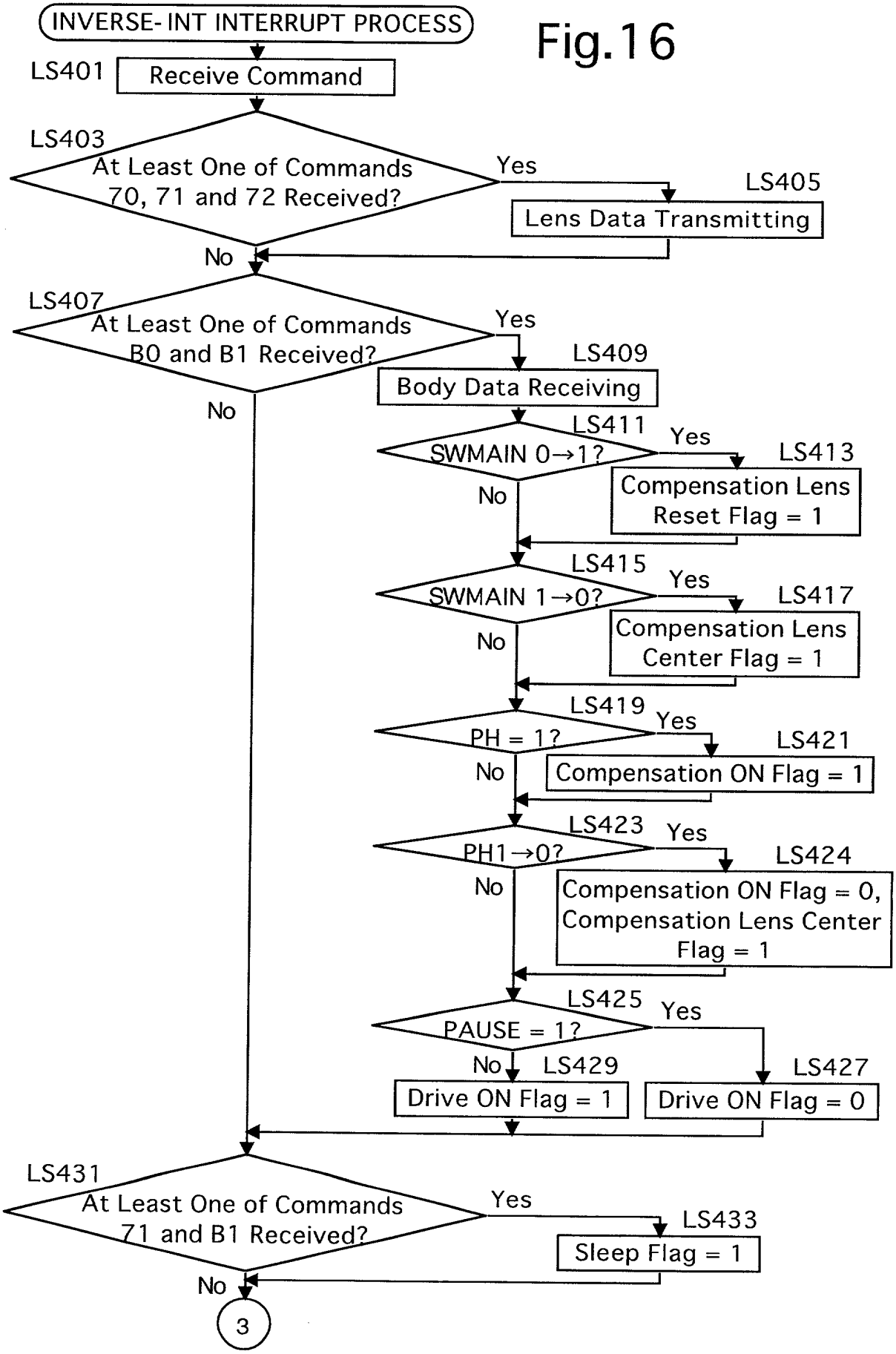

INVERSE-INT INTERRUPT PROCESS
LS401
Receive Command
LS403
At Least One of Commands 70, 71 and 72 Received?
Yes
LS405
Lens Data Transmitting
No
LS407
At Least One of Commands B0 and B1 Received?
Yes
LS409
Body Data Receiving
No
LS411
SWMAIN 0→1?
Yes
LS413
Compensation Lens Reset Flag = 1
No
LS415
SWMAIN 1→0?
Yes
LS417
Compensation Lens Center Flag = 1
No
LS419
PH = 1?
Yes
LS421
Compensation ON Flag = 1
No
LS423
PH1→0?
Yes
LS424
Compensation ON Flag = 0, Compensation Lens Center Flag = 1
No
LS425
PAUSE = 1?
Yes
LS427
Drive ON Flag = 0
No
LS429
Drive ON Flag = 1
LS431
At Least One of Commands 71 and B1 Received?
Yes
LS433
Sleep Flag = 1
No
3

Fig.17

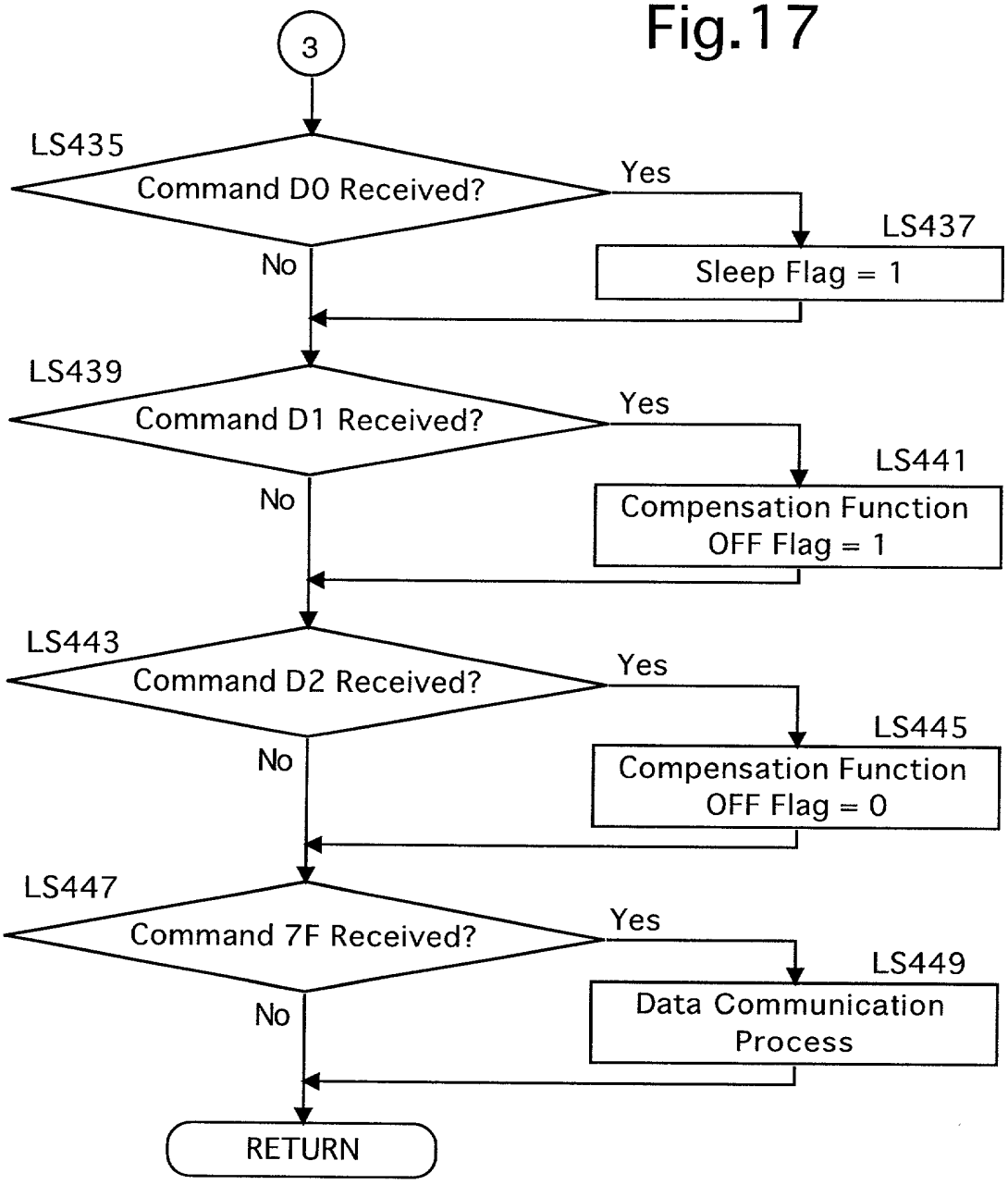

3
LS435
Command D0 Received?
Yes
LS437
Sleep Flag = 1
No
LS439
Command D1 Received?
Yes
LS441
Compensation Function OFF Flag = 1
No
LS443
Command D2 Received?
Yes
LS445
Compensation Function OFF Flag = 0
No
LS447
Command 7F Received?
Yes
LS449
Data Communication Process
No
RETURN

Fig. 18

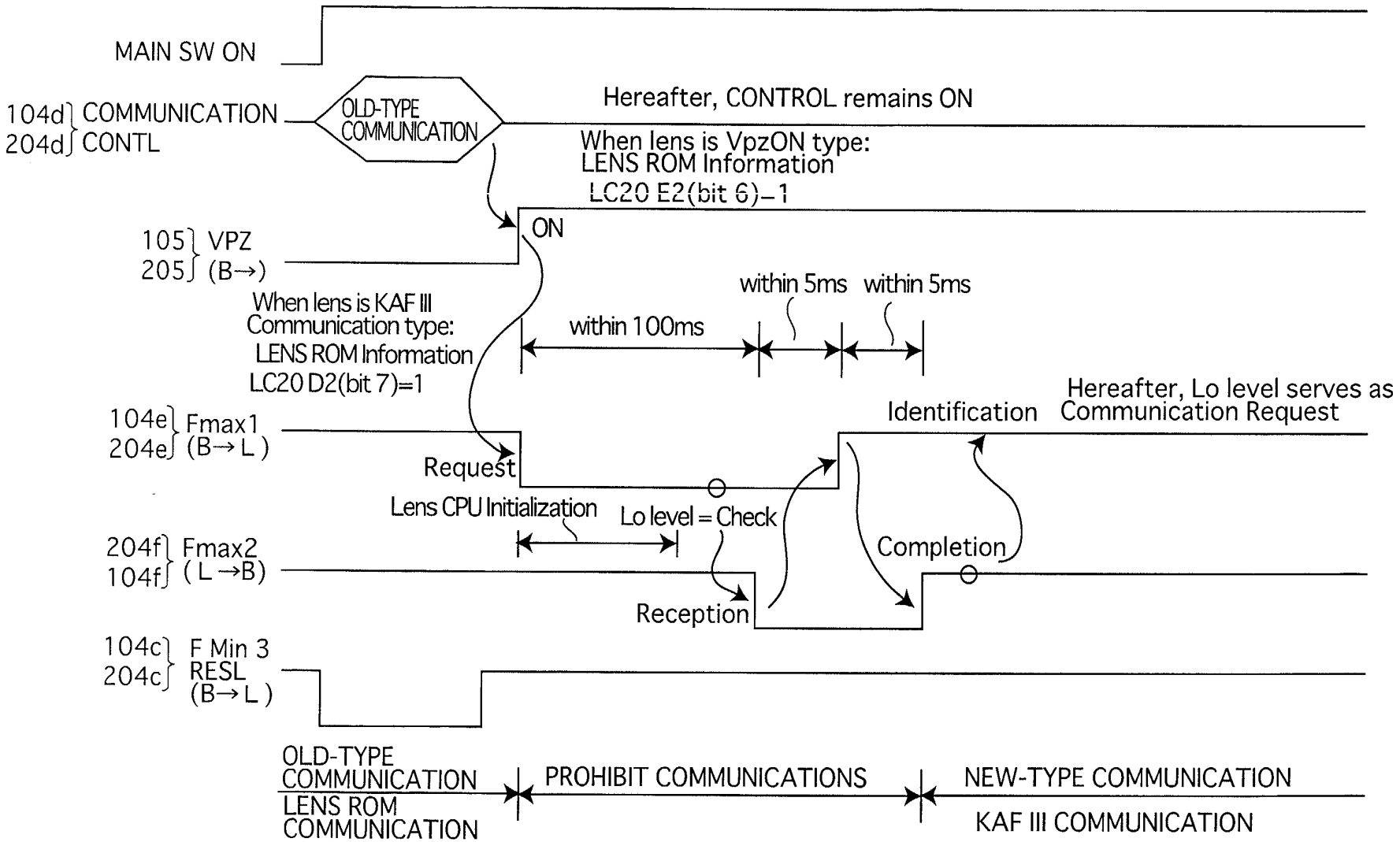

MAIN SW ON
104d COMMUNICATION
204d CONTL
OLD-TYPE COMMUNICATION
Hereafter, CONTROL remains ON
When lens is VpzON type:
LENS ROM Information
LC20 E2(bit 6)–1
105 VPZ
205 (B→)
ON
within 5ms
within 5ms
When lens is KAF III
Communication type:
LENS ROM Information
LC20 D2(bit 7)=1
within 100ms
Hereafter, Lo level serves as
Communication Request
104e Fmax1
204e (B→L)
Identification
Request
Lens CPU Initialization
Lo level = Check
204f Fmax2
104f (L→B)
Completion
Reception
104c F Min 3
204c RESL
(B→L)
OLD-TYPE COMMUNICATION
LENS ROM COMMUNICATION
PROHIBIT COMMUNICATIONS
NEW-TYPE COMMUNICATION
KAF III COMMUNICATION

Fig. 19A

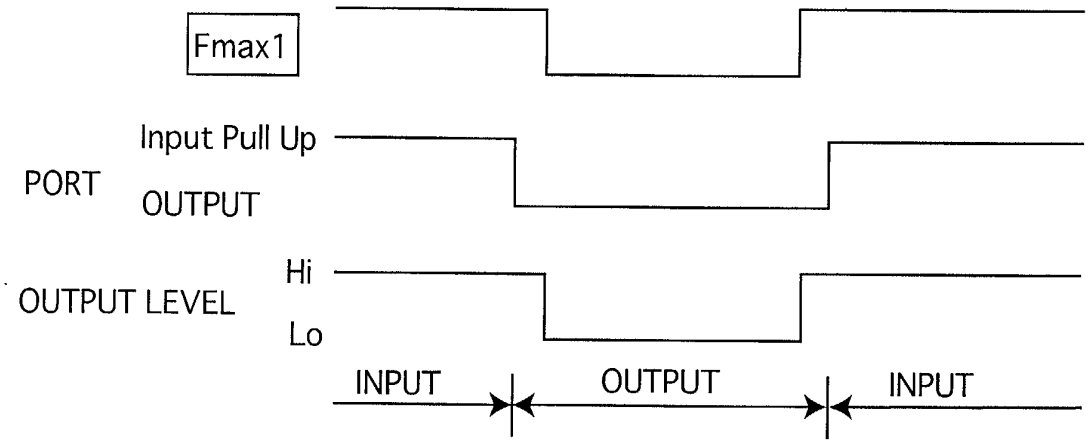


Fig. 19B

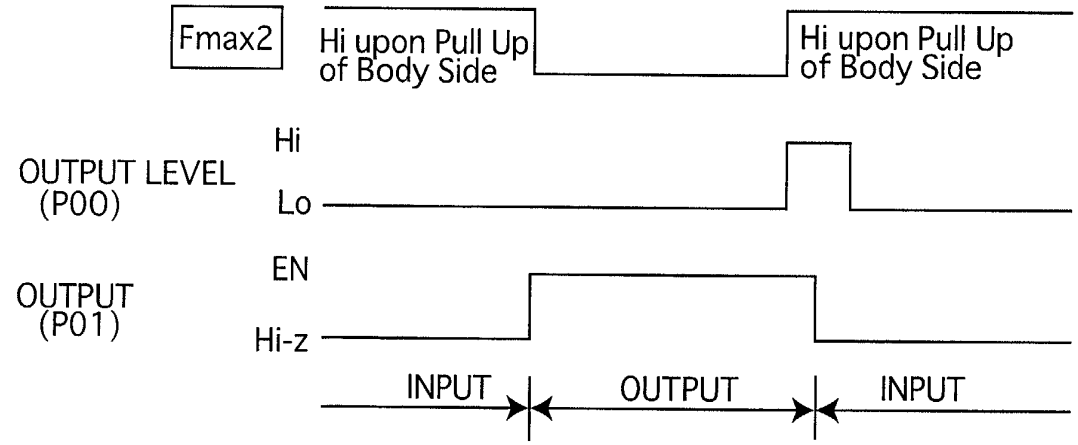


Fig. 20

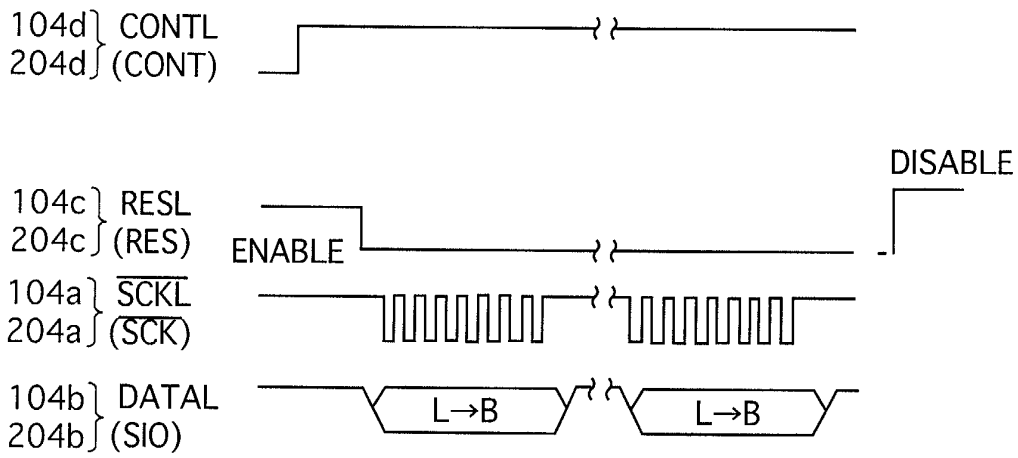
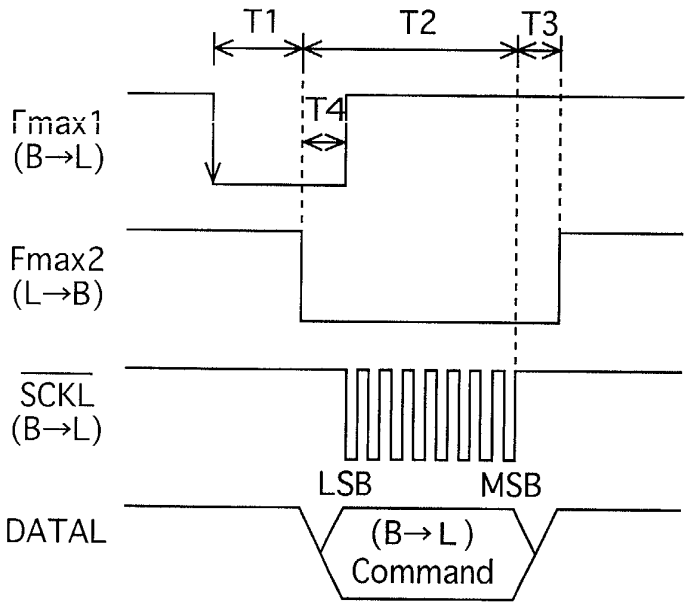
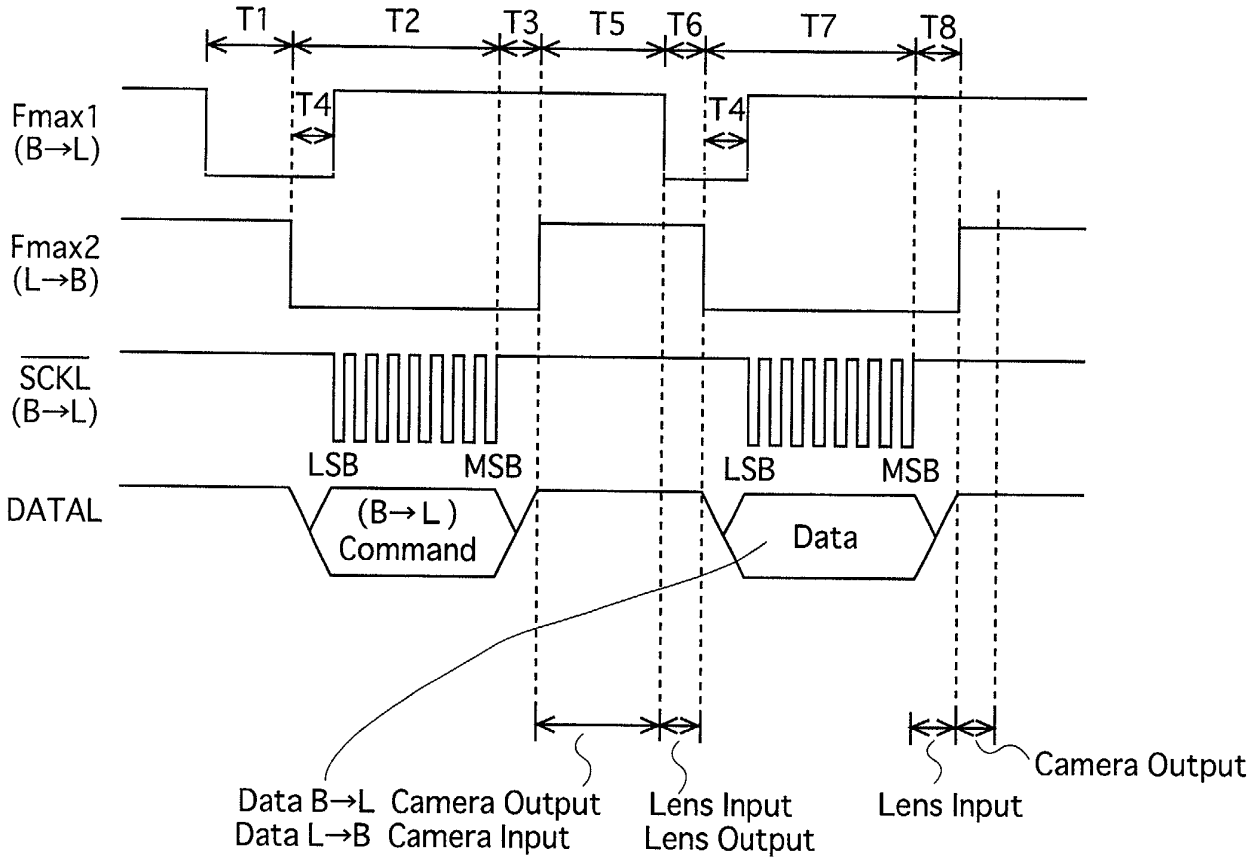

104d
CONTL
204d
(CONT)
104c
RESL
204c
(RES)
ENABLE
DISABLE
104a
SCKL
204a
(SCK)
104b
DATAL
204b
(SIO)
L→B
L→B

Fig.21A



T1: within 50ms
T2: within 5ms
T3: within 5ms
T4: within 5ms
T5: within 5ms
T6: within 5ms
T7: within 5ms
T8: within 5ms
T9: within 5ms

Fig.21B


T1
T2
T3
T5
T6
T7
T8
T4
T4
Fmax1
(B→L)
Fmax2
(L→B)
SCKL
(B→L)
LSB
MSB
LSB
MSB
DATAL
(B→L)
Command
Data
Data B→L Camera Output
Data L→B Camera Input
Lens Input
Lens Output
Lens Input
Camera Output

20220 8T9C800T

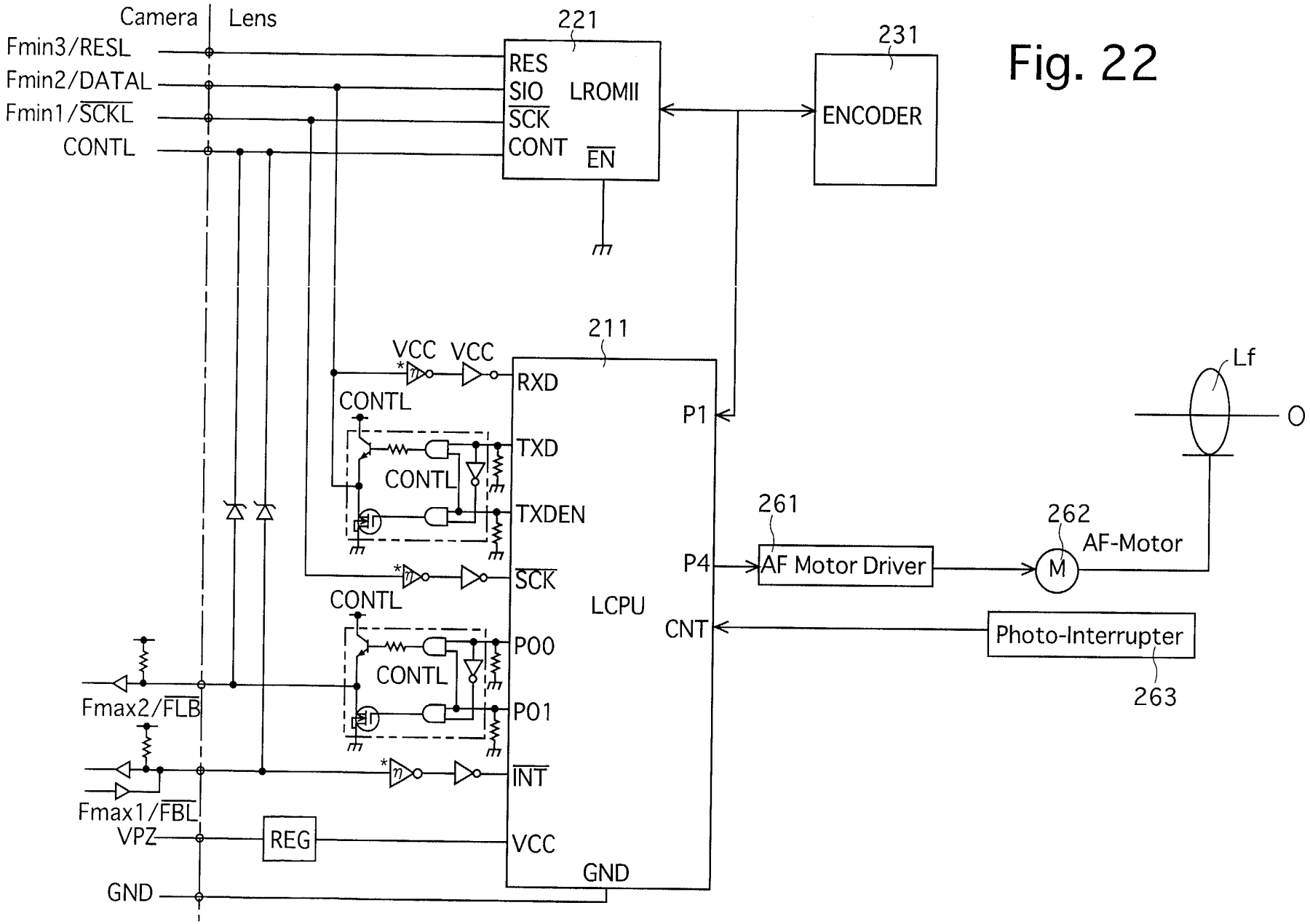


Fig. 22

Fig. 23

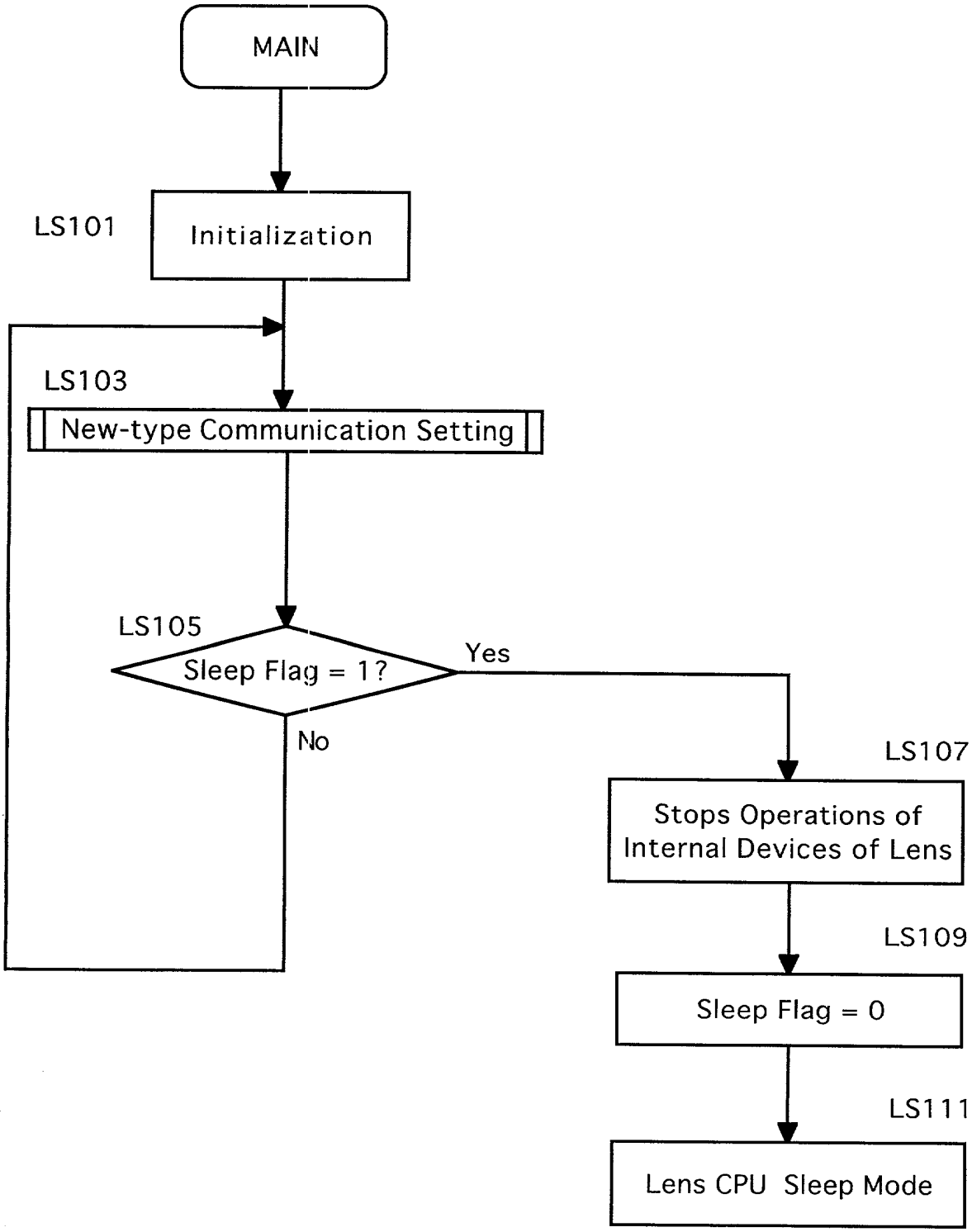
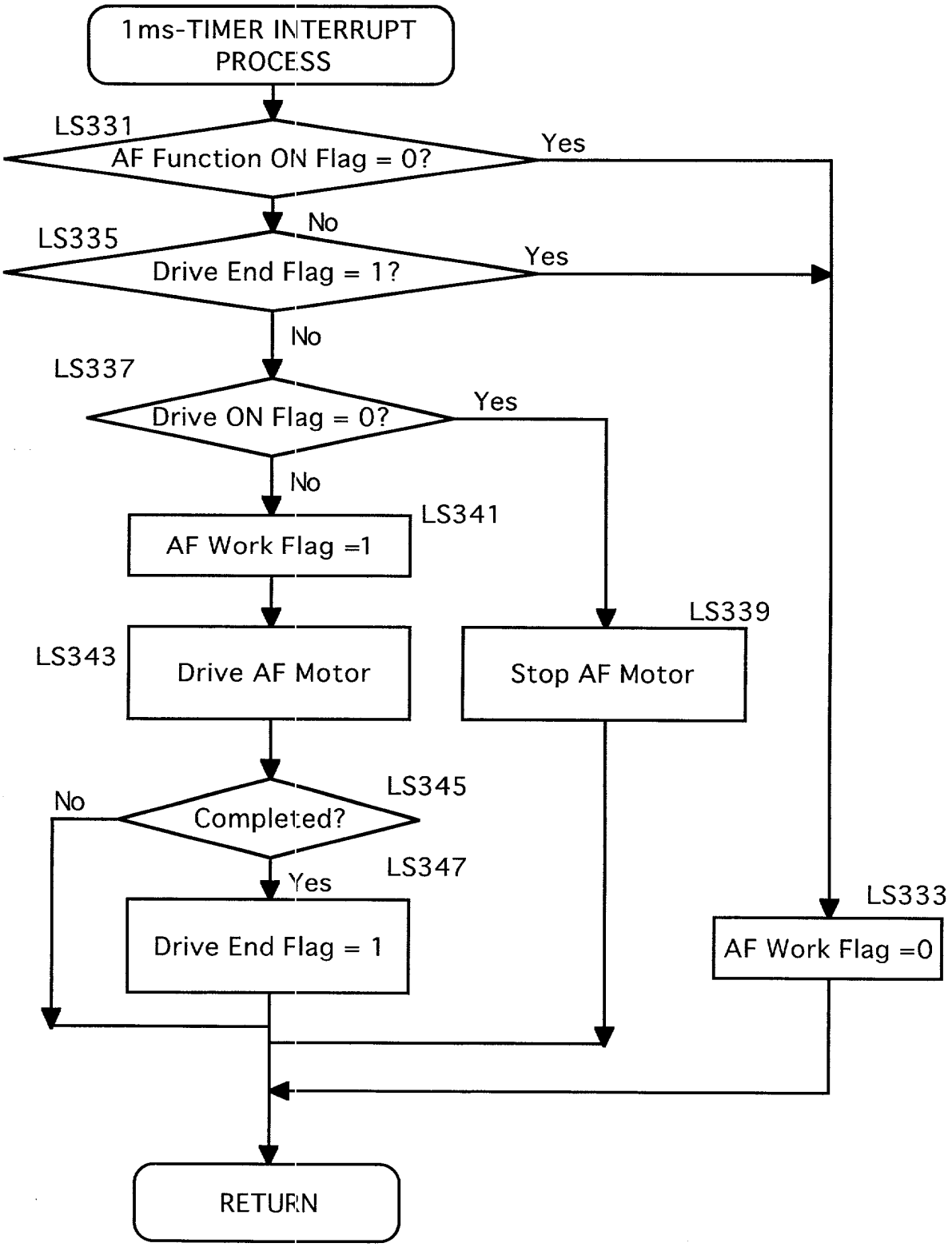

MAIN
LS101
Initialization
LS103
New-type Communication Setting
LS105
Sleep Flag = 1?
Yes
No
LS107
Stops Operations of Internal Devices of Lens
LS109
Sleep Flag = 0
LS111
Lens CPU Sleep Mode

Fig. 24


1ms-TIMER INTERRUPT PROCESS
LS331
AF Function ON Flag = 0?
Yes
No
LS335
Drive End Flag = 1?
Yes
No
LS337
Drive ON Flag = 0?
Yes
No
LS341
AF Work Flag =1
LS343
Drive AF Motor
LS339
Stop AF Motor
LS345
No
Completed?
LS347
Yes
Drive End Flag = 1
LS333
AF Work Flag =0
RETURN

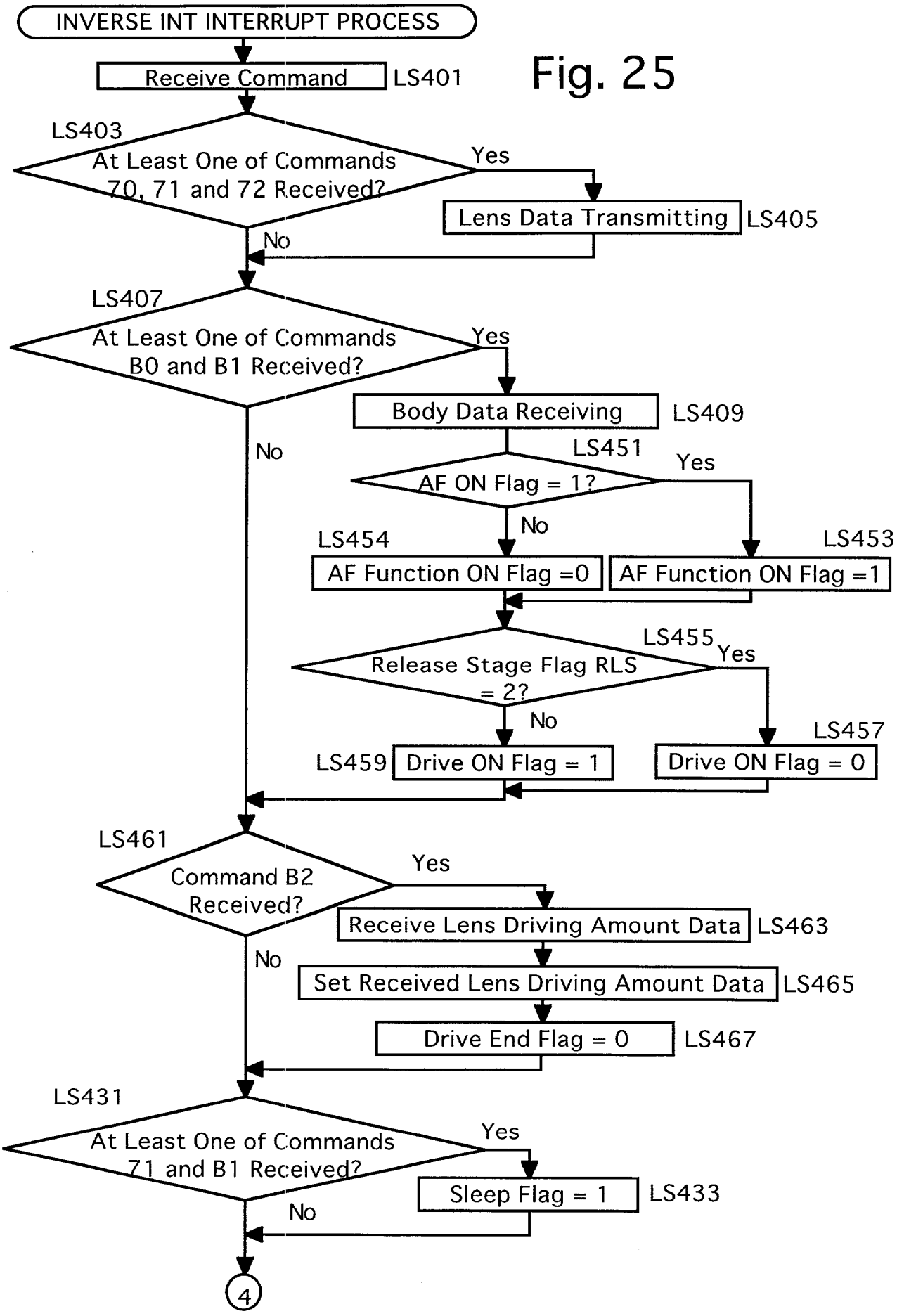

INVERSE INT INTERRUPT PROCESS
Receive Command
LS401
LS403
At Least One of Commands 70, 71 and 72 Received?
Yes
Lens Data Transmitting
LS405
No
LS407
At Least One of Commands B0 and B1 Received?
Yes
Body Data Receiving
LS409
No
LS451
AF ON Flag = 1?
Yes
No
LS454
AF Function ON Flag =0
LS453
AF Function ON Flag =1
LS455
Release Stage Flag RLS = 2?
Yes
No
LS457
LS459
Drive ON Flag = 1
Drive ON Flag = 0
LS461
Command B2 Received?
Yes
Receive Lens Driving Amount Data
LS463
No
Set Received Lens Driving Amount Data
LS465
Drive End Flag = 0
LS467
LS431
At Least One of Commands 71 and B1 Received?
Yes
Sleep Flag = 1
LS433
No
4

Fig. 25

Fig. 26

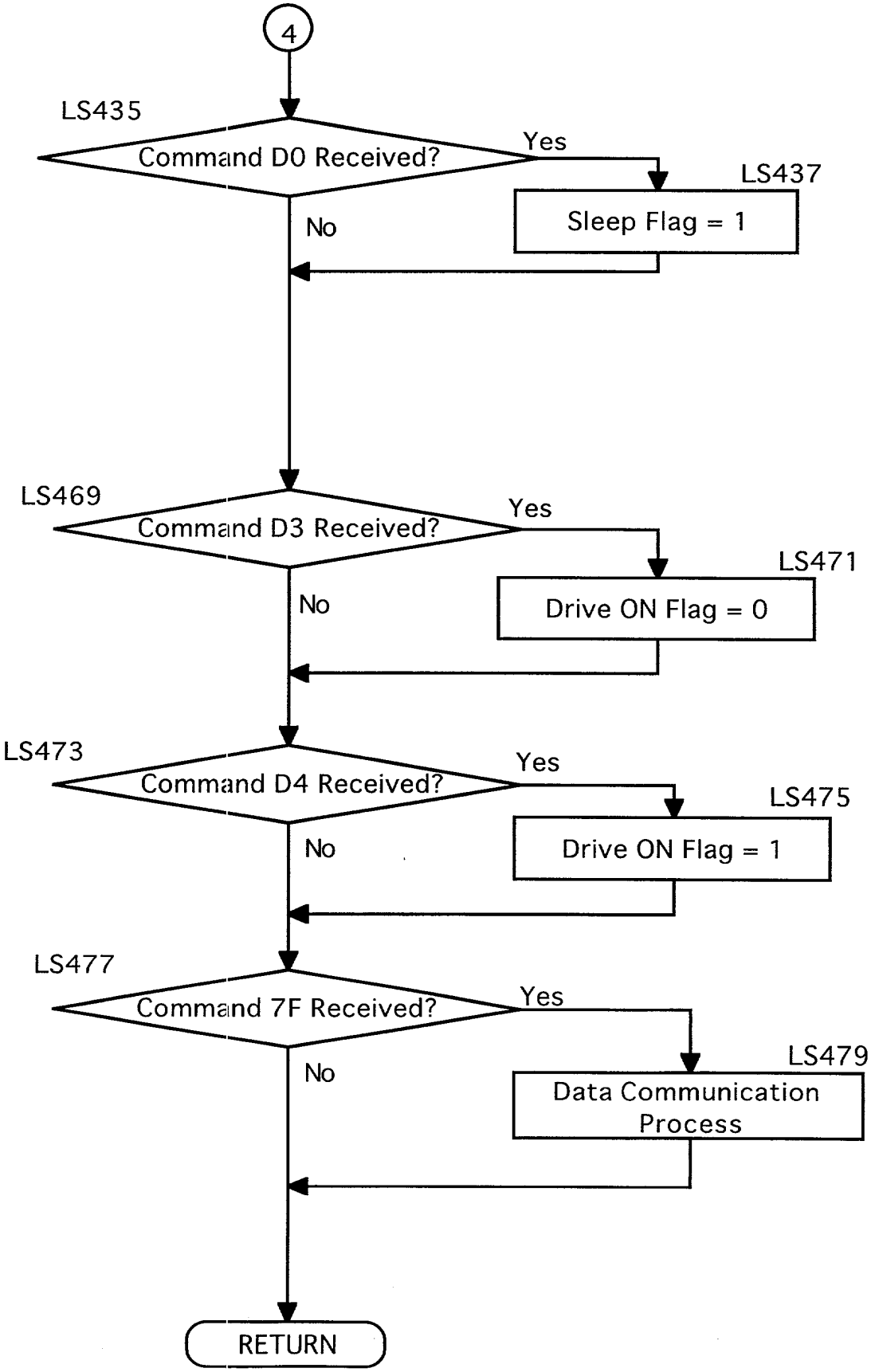

4
LS435
Command D0 Received?
Yes
LS437
Sleep Flag = 1
No
LS469
Command D3 Received?
Yes
LS471
Drive ON Flag = 0
No
LS473
Command D4 Received?
Yes
LS475
Drive ON Flag = 1
No
LS477
Command 7F Received?
Yes
LS479
Data Communication Process
No
RETURN

Fig.27

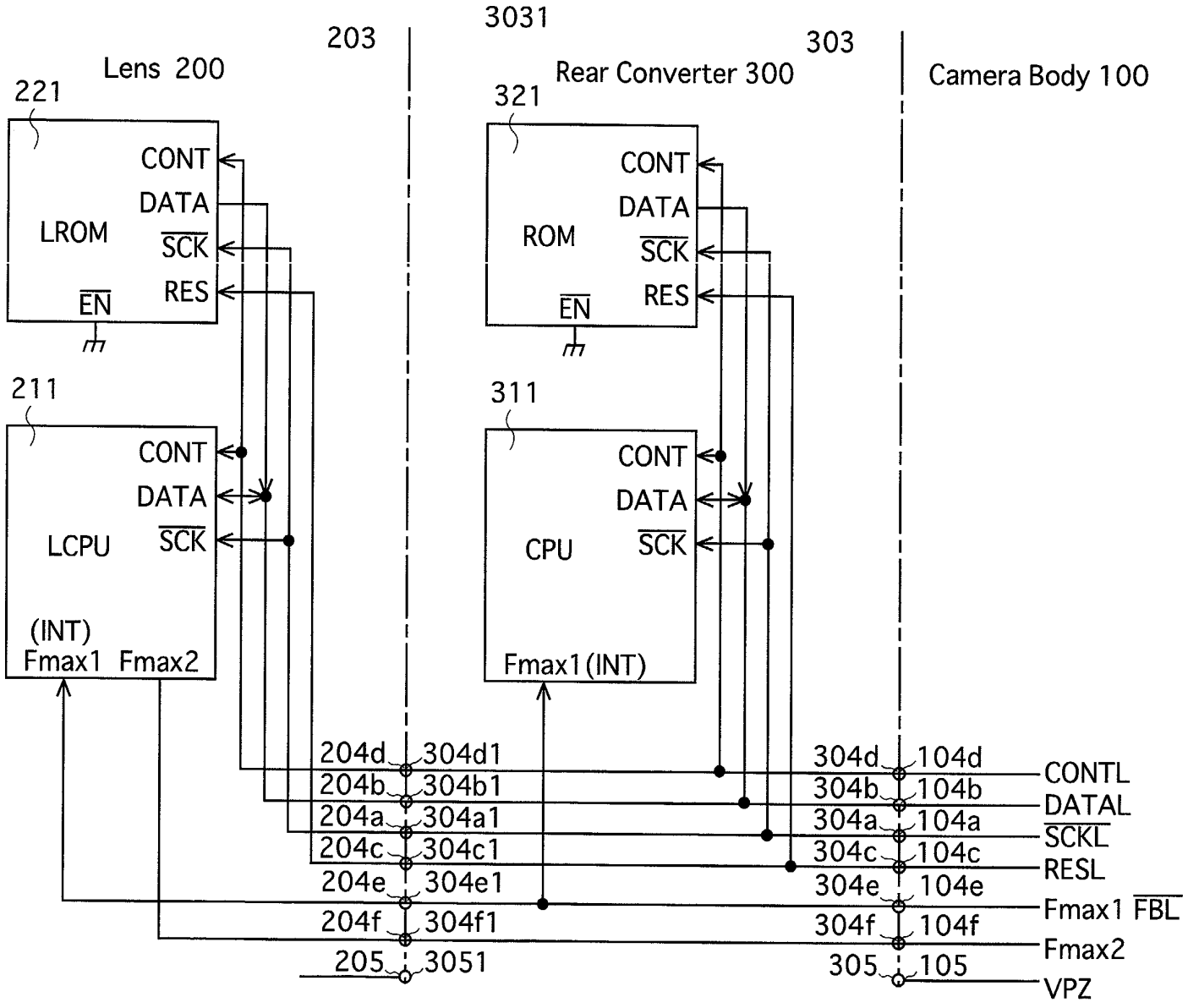
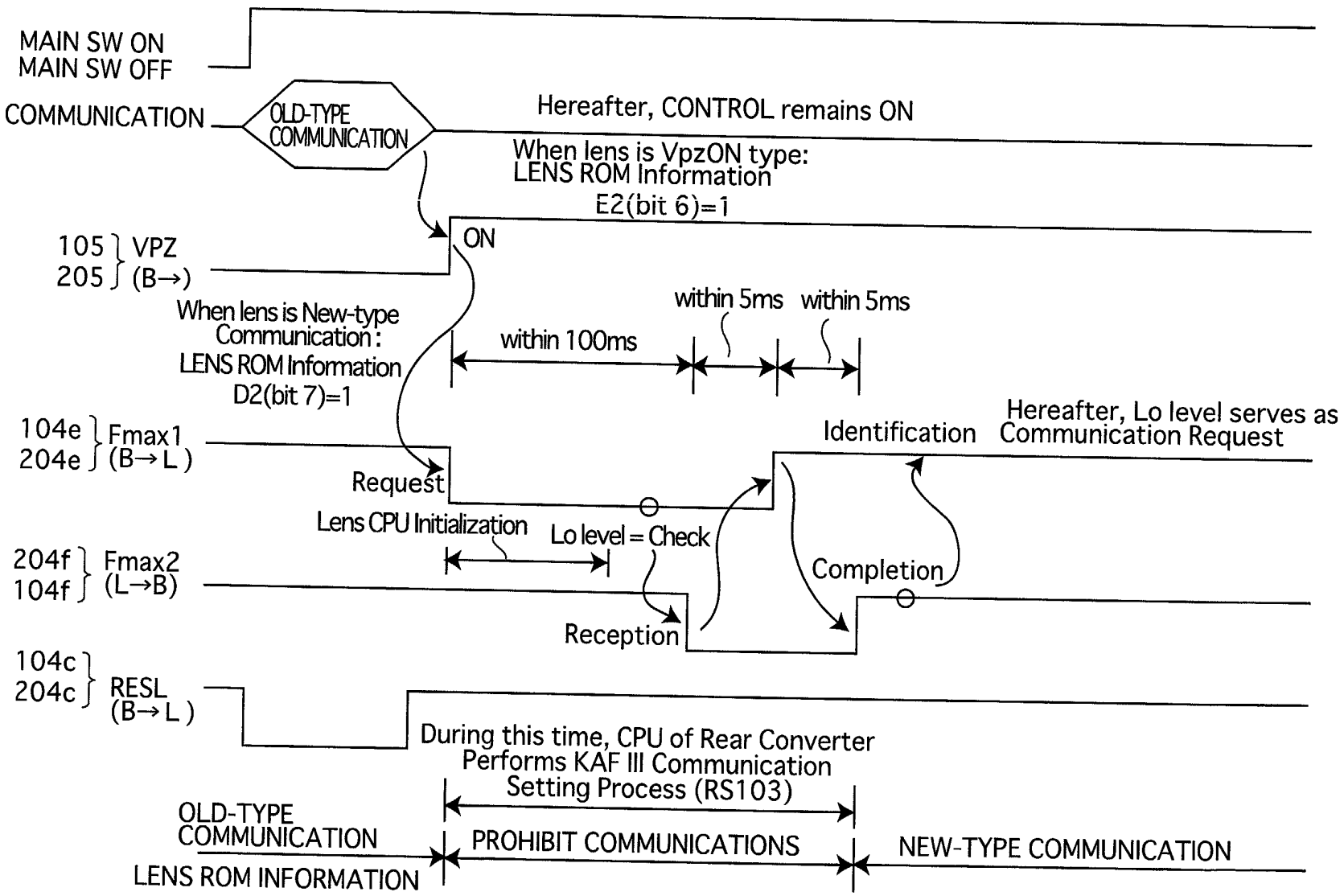

Lens 200
Rear Converter 300
Camera Body 100
203
3031
303
221
321
CONT
DATA
SCK
RES
EN
LROM
ROM
211
311
LCPU
CPU
(INT)
Fmax1 Fmax2
Fmax1(INT)
204d 304d1
204b 304b1
204a 304a1
204c 304c1
204e 304e1
204f 304f1
205 3051
304d 104d
304b 104b
304a 104a
304c 104c
304e 104e
304f 104f
305 105
CONTL
DATAL
SCKL
RESL
Fmax1 FBL
Fmax2
VPZ

Fig. 28


MAIN SW ON
MAIN SW OFF
COMMUNICATION
OLD-TYPE COMMUNICATION
Hereafter, CONTROL remains ON
When lens is VpzON type:
LENS ROM Information
E2(bit 6)=1
105 VPZ
205 (B→)
ON
When lens is New-type Communication :
LENS ROM Information
D2(bit 7)=1
within 100ms
within 5ms
within 5ms
104e Fmax1
204e (B→L)
Request
Identification
Hereafter, Lo level serves as Communication Request
Lens CPU Initialization
Lo level = Check
204f Fmax2
104f (L→B)
Completion
Reception
104c
204c RESL
(B→L)
During this time, CPU of Rear Converter Performs KAF III Communication Setting Process (RS103)
OLD-TYPE COMMUNICATION
LENS ROM INFORMATION
PROHIBIT COMMUNICATIONS
NEW-TYPE COMMUNICATION

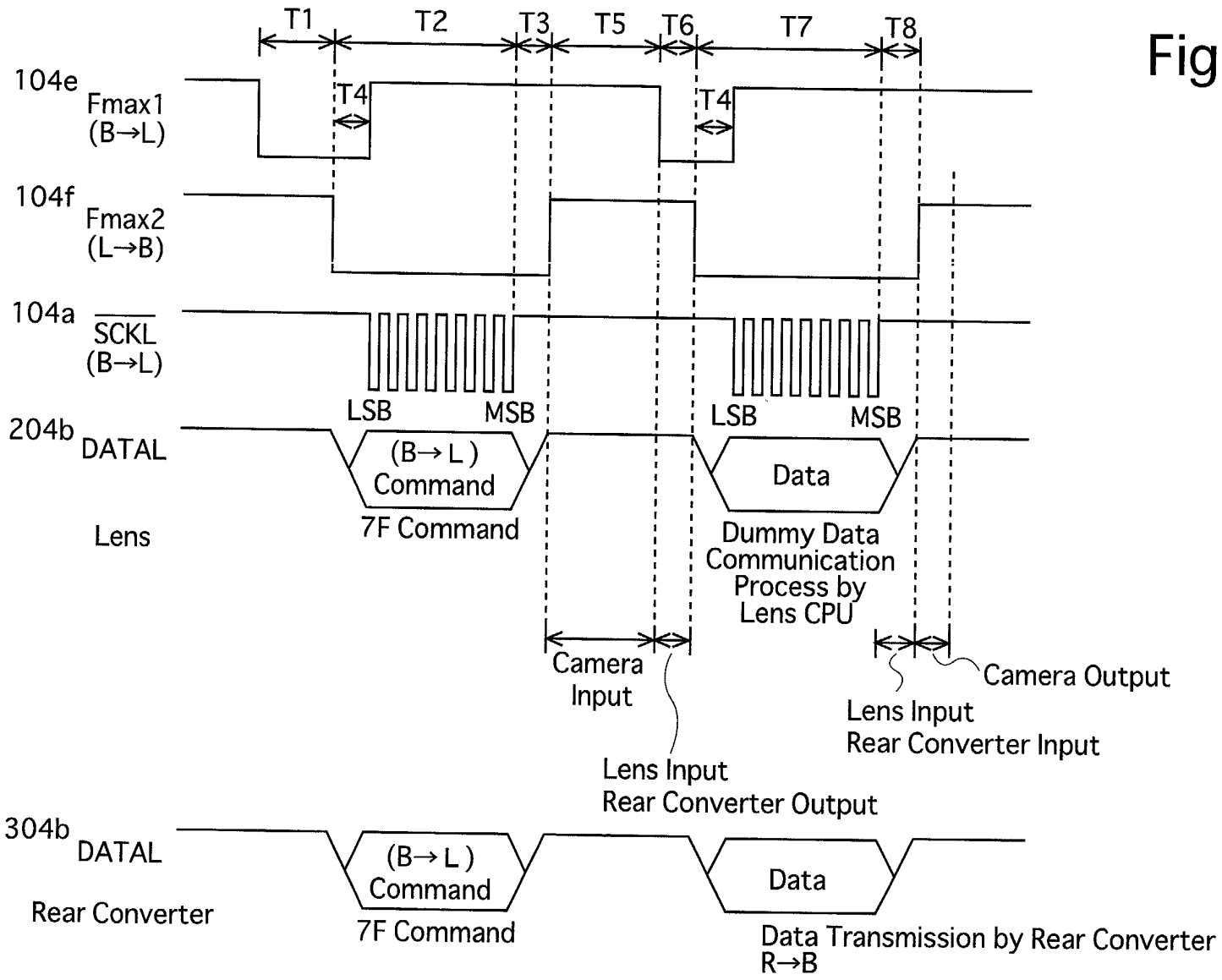

T1
T2
T3
T5
T6
T7
T8
104e
Fmax1
(B→L)
T4
T4
104f
Fmax2
(L→B)
104a
SCKL
(B→L)
LSB
MSB
LSB
MSB
204b
DATAL
(B→L)
Command
7F Command
Data
Dummy Data
Communication
Process by
Lens CPU
Lens
Camera
Input
Lens Input
Rear Converter Output
Camera Output
Lens Input
Rear Converter Input
304b
DATAL
(B→L)
Command
7F Command
Data
Data Transmission by Rear Converter
R→B
Rear Converter

Fig.29

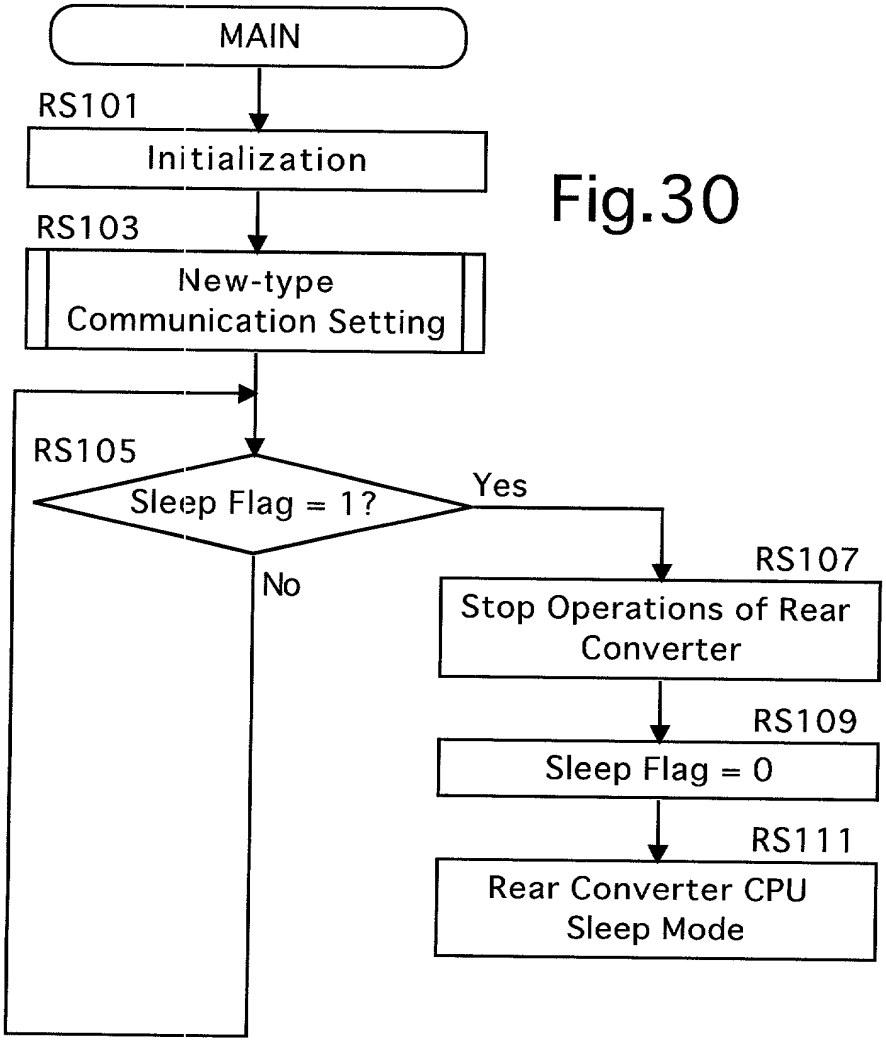

MAIN
RS101
Initialization
RS103
New-type
Communication Setting
RS105
Sleep Flag = 1?
Yes
No
RS107
Stop Operations of Rear
Converter
RS109
Sleep Flag = 0
RS111
Rear Converter CPU
Sleep Mode

Fig.30

Fig.31

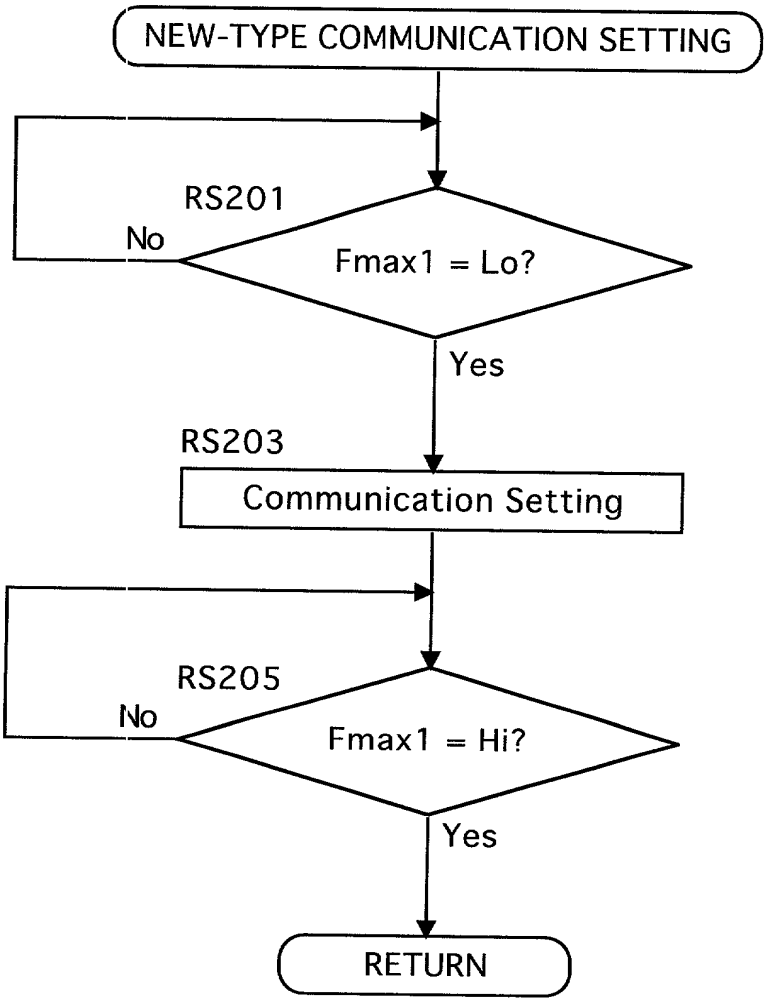
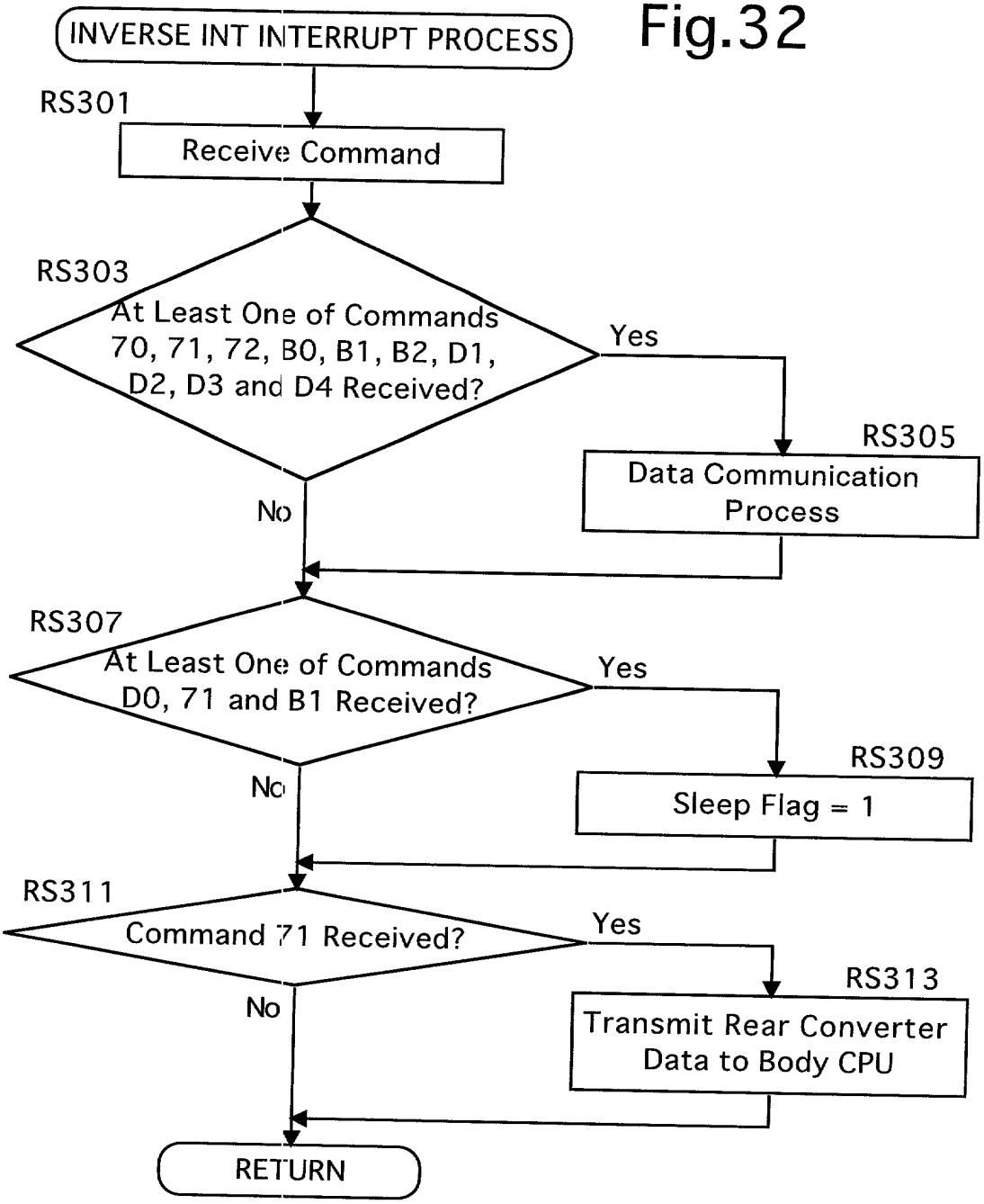

NEW-TYPE COMMUNICATION SETTING
RS201
No
Fmax1 = Lo?
Yes
RS203
Communication Setting
RS205
No
Fmax1 = Hi?
Yes
RETURN

Fig.32


INVERSE INT INTERRUPT PROCESS
RS301
Receive Command
RS303
At Least One of Commands 70, 71, 72, B0, B1, B2, D1, D2, D3 and D4 Received?
Yes
No
RS305
Data Communication Process
RS307
At Least One of Commands D0, 71 and B1 Received?
Yes
No
RS309
Sleep Flag = 1
RS311
Command 71 Received?
Yes
No
RS313
Transmit Rear Converter Data to Body CPU
RETURN